

THE
VANITIES
OF

Philosophy and Physick :

TOGETHER WITH

Directions and Medicines easily prepared
by any of the least Skill, whereby to preserve
Health, and prolong Life, as well in those that
live Regularly, as others that live Irregularly.

Comprizing moreover

HYPOTHESES different from those of the
Schools throughout almost the whole Art of Phy-
sick, and particularly relating to Indigestion, and
other Diseases of the Stomach, Fevers, Consumption,
Stone, Gravel, Suppression of Urine, Apoplexy,
Palsie, Madnes, Diseases of the Eyes, and others :
With Variety of Medicines, and Rules whereby
to make particular Choice out of them.

*The whole being a Work very useful to all, but especially
to those that have any Relation to the Art of Physick.*

By *GIDEON HARVEY*, M. D.
The KING's Physician to the *TOWER*.

The Second Edition, much enlarged.

L O N D O N :

Printed for *W. Turner* at the *Angel*, at *Lincolns-Inn-
Back-gate*. 1700:

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THE INTRODUCTION.

Here is no stout Dedication to any Illustrissimo for a Protector, who beyond all peradventure knows nothing at all of the matter; and tho' you should flatter him with all the Hyperbole's of his Family or Ancestors, and of his great Endowments and heroick Virtues, yet he would think himself not paid in full, for lending of his Name to adorn your Frontispiece. The motive of publishing this Tract, is not the intercession of Friends; for none of 'em ever had the view of any part of it. Neither would I be so unfortunate to please many of the Faculty; for that must infallibly draw upon me the Envy and Hatred of Ten times the number, besides Calumnies and Reflections. The chief inducement proceeds from an inclination to Mankind, to instruct them, to preserve and prolong their Lives; thereby to prevent them from using fraudulent Quack Medicines, (which are now become so Universally vendible among them) or advising with such as are wholly Ignorant, and consequently very Bold. I do in no wise pretend in these following Sheets, to make a Lecture to the Learned; tho' I should think my self sufficiently rewarded for my pains, if I could arrive to the point of advancing the Art of Physick, by offering to them my Observations on the pretended and fallacious Methodus medendi, depending upon false Indications (received for true) abstracted from Diseases and their Causes, and by proposing the trials I have made of the best and most celebrated Remedies, which upon diligent inquiry in my thoughts I could not find to have contributed any thing towards the curing of Diseases; and tho' removed upon the use of 'em, I am certain ought to

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be ascribed only to time and strength of Nature, and to be term'd Curing Diseases by Expectation; Besides, I hope by making so great a number of Doubts, and moving as many Difficulties, to have done some Service to the Art, in giving learned Men the occasion to remove them, and to take seriously into their Consideration, whether all, or most part, and indeed any part of what the Ancients have transmitted to us concerning Diseases, and their pretended Remedies recited in their Books, and by others afterwards compiled into Dispensatories, ought to be received by us with an implicate Faith, so as to doubt less of the truth of them, than of those fine Histories of an Alexander, or a Cæsar.

After all, I must tell you, a Self-Interest prevail'd very much with me in the printing of this, which is, that writing an ill hand, and being puzzled sometimes to read it, and the Matter not digested into any sort of order, I might have a more easie recourse to my own Thoughts and Sentiments, being expressed in Characters more legible, and so disposed, that I could then more readily turn to them.

I do also think my self obliged to take notice, that in the following Discourse I have very much receded from those Opinions written by me in former Treatises, whereinto the almost universally received Doctrines of Authors, and my neglect of examining of them rationally and experimentally, had led me, as you may more particularly observe hereafter, for all which Terence in *Adelphis*, Act. V. Sc. iv. seems to make a sufficient Apology, viz.

(fuit,

Nunquam ita quisquam bene subducta ratione ad vitam
Quin res, ætas, usus semper aliquid apportet novi,
Aliquid moneat: Ut illa, quæ te scire credas, nescias,
Et, quæ tibi putatis prima, in experiundo ut repudies

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The Sense in English is; That no Man ever made so exact a Calculation of matters in his life time, but either the occasion of things, or length of Years, or Experience, doth offer something that's new; and gives you to understand, that what you thought you knew very well, you do not know at all; and causes you by making trials to reject that, which before you did most approve of. This I must own to have found true in my self, and particularly in reference to continual putrid Fevers, which are most common in France, and malignant Fevers most frequent in England, very few of the former being observed here. I did as near I could imitate the generality of Practisers in curing of them; I advised Bleeding as frequently as others, tho' nothing near so frequently as now they do, which is a far greater Error in malignant Fevers (as most of ours are) than in those, commonly call'd Continual Putrid Fevers; not forgetting cooling Apozems and Juleps, that allay the heat, and abate thirst; sweating Juleps and Pouders to drive out the Heat, that is, those nitrosulphureous and bituminous Particles that might occasion that Heat, as I then thought, and not neglecting Glistering and Blistering; for I did observe, that whoever died without the application of Spanish Flies, the Vulgar did most certainly impute the Cause of that Man's death to the ignorance or neglect of the Physician, in not applying of the Tormentors. Upon the calculation of the whole matter, (as Terence saith) I found by length of years, that cæteris paribus, as many as were not physically treated, recovered, and in some Seasons many more recovered than those that had been oft Laced, Cordial'd and Sweated, Glyster'd and Blister'd: Which wrought this Opinion in me, that all the Hypotheses of Fevers, whether seemingly true or false, were of no manner of service, to

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ground the practical part upon; for even now do what you can, the Fever walks on from the Beginning through the Augment to the State, and if the Patient hath not been over-blooded, or preposterously purged, he may pass through the Declination to a condition of Health. This being seriously observed by me, put me upon forming a different Hypothesis, and Indications conformable to it, whereunto the Indicata, or Remedies responding do evidently and sensibly abate the Cause and Symptoms, without suffering the Fever to run up to a state. I have had very lately occasion to make Observation upon a sort of malign Fever, that was popular about us. They were generally taken with Coughs, Drowsiness, moveable Joint-pains, commonly termed Rheumatic Pains; some did spit Blood, and afterwards Matter; they were for the greatest part free from Drought, their Urine of a good colour with a whitish Sediment, the Pulse slower than usually in the state of health. They generally said they ailed nothing, they were not sick, but they had gotten a great Cold, tho' they were suddenly reduced to the greatest weakest. Those that upon their own heads, were Blooded after the fourth day, or were Blooded more than once died. Others that were Blooded sparingly once within the two first days, sensibly recovered upon the using of an uncommon Antifebril Medicine. Another mistake I have oft taken notice of, importing, That what is expectorated by Patients properly Consumptive, by reason of an Ulcer in the Wind-pipe, or the Bronchia, (for it is not frequently observed so be in the Lungs) attended with an Hectick Fever, is all pus, or a materia purulenta, which is not possible; for should all that thick glary greenish, yellowish, and sometimes whitish matter be pus, that is expectorated by such, which I have seen bath ex-
ceeded

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ceeded the measure of a Quart, and more, in four and twenty hours, it would exceed the quantity of forty or fifty very large external Ulcers, tho' situated near great Vessels; so that I conceive there is only some purulent matter mixt with a slime corrupted, and putrefied to an extremity, and therefore that commonly is not only attended with a stink, but all their breathing out of their Lungs, and Pores of the ambient Skin, stinks, as doth also their *Vit*uals, if by chance they happen to vomit them up. Wherefore I do apprehend, that all the Humours in their Vessels are corrupted and stink, and that all their Bowels are tainted: So that the French have no other word to denominate a Consumptive, than *Pourie*, which signifies rotten: Were it only an Ulcer, the Difficulty would not be very extraordinary, that being easily cur'd; for we see daily, that the Ulcers occasion'd by a *Pleurisie*, and a *Peripneumonia*, are oft cured very speedily of themselves, without administering any Medecines. To pretend to cure a Confirm'd Consumptive, is equal to make a new Man, new Bowels, and new Humours: It is in the beginning only this Disease admits of a Cure, and which must be perform'd with Remedies very uncommon.

Before I leave this Subject, I ought to obviate a very considerable Objection, viz. A Stinking Breath, which some are affected with during the whole Course of their Lives, to a degree, that they are capable to perfume a whole Room, is commonly supposed to proceed from putrefy'd or rotten Lungs, notwithstanding is seldom or never attended with an *Hectick Fever*; and as incurable as it is, is not accompany'd with a rotten Cough, nor doth it taint the Bowels, nor infect the whole Mass with Putrefaction; and therefore an Ulcer in the Lungs, *Aspera Arteria*, and *Bronchia*, cannot import that Danger, nor infect

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the Bowels and Humours with a Stink and Putrefaction, as the fore-going Discourse seems to insinuate. This Difficulty is easily remov'd: That sort of Stinking Breath, which is here instanc'd, doth not proceed from the least Putrefaction of the Lungs; for very oft those Persons so affected have very sound Lungs, breath well and free, live to a great Age, and digest their Victuals very well; which is a sign also, that neither the Stomach can be suspected to steem up such a lasting ungrateful Fume, tho' it must be granted, that a stinking Breath may for a time be occasion'd by Steams, arising from a foul Slyme in the Stomach, corrupting there, and relaxing the upper Orifice so, as it doth not close so exactly as it ought: But this is soon cured, by clearing the Stomach by a Vomit, or Purge. You are therefore to apprehend, that the Cause of a perennial Stinking Breath in those healthful Persons, is to be imputed to Slyme issuing daily and hourly out of the Glanduls of the Throat, and harbour'd in some deep small hollownes or crevice near the Tonsils, and sometimes on the back-side of the Uvula, either towards the Right or Left Tonsil, where being kept long, and constantly meeting there with a putrid Slyme that was left there before, doth corrupt and putrefie the Slyme that ouseth thither every Moment: The Breath of the Lungs passing by, carrieth those putrid Steems with it, and so causeth that Stinking Breath, which is but very little amended by sweet perfum'd Lozenges, chawing of Orange-peel, Spices, or sweet Confects. The only Palliative Remedy is, to use a strong absterfive penetrating Gargarism four or five times in a Day, especially in the Morning soon after Rising, and at other times after Eating and Drinking, made of a good quantity of Wormwood-tops, Century-flowers, Orange-peel and Juniper-berries, boild in Vinegar, or White-Wine, sharpen'd with Spirit of Sulphur. This, by piercing into that Crevice, or Hollownes, and wiping off the putrid Slyme, removes the Cause, and renders the Breath very tollerable for a considerable Interval, and by chance may in time wholly cure it, tho' commonly it is incurable.

To conclude; I do wish, that what I have publish'd in these following Papers, may be as serviceable to others, as I do conceive (if I am not under a mistake) they are, and have been to me.

THE

THE VANITIES OF

Philosophy and Physick.

CHAP. I.

*Representing some Vanities of common Receipts,
Herbs, and Herbals.*

I. **T**Ho' all Nations are imbued with various Specifick Qualifications, wherein each differ from the other, yet that of Credulity, or an easie rash and inconsiderate Belief may be conceived, to be universal to Mankind, and to which not improbably ought to be imputed the sequel of the most frequent and greatest Errors, Deceits, and Impostures, most Men are daily and hourly plunged in, as the source and spring of all, as may be plainly Evidenced in each of the Three subsequent Faculties, I mean Divinity, Law, and Physick. The *Popish*, *Mahometan*, *Sun*, *Moon*, and Devil Worshipping Religions, embraced by such innumerable Multitudes, also all Heresies, Schisms

Schisms, pretended Witchcrafts, Sorceries, and Exorcisms, howsoever erroneous, imposing, and deceitful, these all may be censured, flow from no other head or fountain, than an easie inconsiderate Belief given to the Insinuations of cunning subtil little Priests; And he that gives a precipitant credit to the Language of a Seller of Lands, Houses, or other Merchandizes, doth not rarely repent his rash Belief, especially when he adds to his Error, his too easie acceptance of relief, from the doubtful Remedies of a vulgar Lawyer: But it is the third Topick before-mentioned, is design'd for the chief Subject of the present Discourse, which I shall endeavour to explain in its extent.

2. That most of Men do very readily take upon trust any Remedies or Receipts, that are confidently recommended to them, can scarce be contradicted; and their fond passion in the inconsiderate belief of 'em is so great, that without any loss of time, they are to be Registred in their Book of Receipts, handed to them possibly by their Grannam, and *Archive* like to be lock'd up in their Desk, secur'd in a lock'd Closet, within a lock'd Room. Three such Locks being broke open by a notorious Thief, Stole thence a Hundred Pounds in Moneys numbered, and a Book of Manuscript Receipts finely covered. The Party injured condoled the loss of his Remedy-Manuscript to such a Degree, that it wholly drowned the loss of his Money-bag, which he would readily have compounded for the restoring of the Book, which the blank Paper in it excepted, would have been over-valued at Two-Pence.

3. The next recital coming within my knowledge, will give you a farther taste of this sort of foolish Credulity. The Servant of a Linnen-Draper had so great an Interest in her Mistress, as to borrow out of her Husband's Closet a Book of scribbled Receipts, which through a Communicative kindness to one of my Maid-Servants, was entrusted with her to be Transcribed; but the Master daily conversing in his Closet, soon missed what he so frequently eyed, and valued

valued above all what was in it; upon a strict enquiry after the matter, his Wife as soon qualified his uneasiness, by acquainting him where this valuable Treatise was to be found, who not long after accosted my Maid several days, being delayed for want of an opportunity of Transcribing. The Person being tired by unsatisfactory Answers, resolved to disclose to me the cause of his so frequent Conferences with this Menial of mine; and promising to use my Authority with her, I did not doubt, but I should oblige him with the return of his Book next Morning at a certain Hour, at which time precisely he came, when I did not fail to discharge my promise, in repossessing him with his Book, which he received from me with all the respectful Reverence, that Hands and Knees could express. You will not judge it improbable, that my Curiosity should lead me to inspect these Papers, which to the best of my Memory contain'd an excellent way to Stew a Calves-Head with Oysters, another to make Fritters, and some other pieces of Cookery; also a Salve for Chilblains, a Plaister for all sorts of Swellings, an infallible Drink for the Stone, a most certain Remedy against a Consumption, and all sorts of Coughs of the Lungs, being a Syrup jumbled of most strange Materials. Varieties of other Infallibilities of Remedies equally foolish I pass by, and shall only remark the immensity of this Man's Belief, by his Mournful Countenance, whilst his Book of Secrets was absent from him, and to what Serenity he was restored upon his Reinstatement.

4. Suppose one of these Medecines were to be taken out of this Magazine of Health, and to be applied against a Consumption, Stone, or any thing else, the failure he would most certainly attribute to the want of some of the Ingredients, their too long being gathered, too much or too little being boiled, or to a hundred other Miscarriages, insomuch, that it would not give the least shock to the stability of his belief, which might not be singular in this person, but general in thousands.

5. It would by many be Censured an Usury in a Person, that from the Expence of 30 or 40 Shillings, in the purchase of a *Gerard's Herbal*, or such like Picture Book, he should expect such an excessive Interest for his Money, as the value of knowing the faces and vertues of so many hundreds, or rather thousands of Plants doth amount to: And indeed, the Bargain of that Plant-Book would prove extraordinary Cheap, did what is contain'd in the hundredth part of it, answer to Truth in matter of Fact, which gives me occasion to make this Inference; that Herbals are fitter for Gardiners than Physicians, in furnishing the former with a Scheme of Figures of so many thousand Weeds there described, and consequently ought to be thrown out of their Manures, as Absorbers of the juice of the Earth, that should give Nourishment to their Esculents. However, to prevent contradicting the Old Phrase, *Natura nihil facit frustra*, it may not untruly be affirmed, that the generality of Herbs growing in Fields, Meadows, and Hills, Nature seemed chiefly design'd to bestow upon Beasts. It would therefore be an Employment fitter for Boys, that love rambling and sintring about Feilds, and Hedges, to go upon Simpling, (as our Botanists do term it) than for Men, to make such needlets, and not unchargeable Journeys, to the remotest Hills, and Woods, only to be acquainted with some New faces of Plants, and take the Portrait of 'em, to be placed together in some Bulky Volume, whose immensurable industry doth no more than equal those, that have taken the pains to abstract the Pictures of variety of Beasts, Fishes, Birds, Flies, and other Insects, in the manner of *Aldrovandus* and his Mimicks, who in that sort have passed their Lives in doing of nothing.

6. What respect is paid to *Hippocrates* and *Galen*, for their Services in Medicine, and to *Geber* or *Paracelsus* in Chymistry, *Dioscorides* may Challenge in Herbarry, he being by Profession an Old Soldier, and worn out by the Fatigues of Campaignes, with the assistance of his Crutches and Stumps made a shift
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to Perambulate Woods, Hills, and Dales, in pursuit of Herbs and Weeds, with a design to get his Bread by Experimental Application in the Cure of Diseases, wherein he attained the success of *Gypsies*, that by foretelling the ignorant their good or bad luck, sometimes hit, and sometimes missed. Their casual hitting gives them Reputation enough, to persuade People, that their missing is occasioned by their misunderstanding the *Southsayer's* Predictions, or their own forgetfulness of what was told them, so that many do readily believe these *Gypsies* to be never-failing Prognosticators, not unlike *Dioscorides* his Herbal Performances, who by his green Remedies observing some Diseases disappearing, made no doubt of ascribing their Cure to 'em, and as boldly to hand the *Probatums* to succeeding Ages, which as confidently without the least scruple, even to this day do receive them, not thinking that length of time, change and sparseness of Diet, alteration of the Air and Season, universal and particular Evacuations might perform the main part; the Truth of which seems by many instances to appear to me. That *Betony, Rosemary, Sage, Lavender, Mother of Tyme, French Lavender, Piony, May-Lilly, Lime-Tree-Flowers,* and the like, upon the use of 'em, by direction of the Learned, for many Days, Weeks, and Months, have failed in the Cure of Head-Aches, Tremblings, Swimmings of the Brain, Convulsions, and other Distempers of the Head, can best be attested by the Advisers; though it cannot be denied, that some of these Diseases have gone off in very few, upon the application of the foresaid Vegetables; but whether to be imputed to the virtue of these, may be matter of Inquiry: However, hit once and miss a hundred times, is a sign of no great infallibility.

7. That a Million of Consumptives labouring of an ulcerous Disposition of the Lungs, have been frustrated by a very long use of *Ground-Ivy, Maiden-Hair, Ysop, Scabious, Lung-wort, Coltsfoot, Sanicle, Golden-Rod, Ladies-Manicle, Bugle,* and forty more,

more, tho' used in all the forms and shapes, is sufficiently recorded in most of the Church-yards of this Island.

8. The Stone-grinding and Piss-driving-Herbs, as *Saxifrage*, *Maiden-Hair*, *Speedwell*, *Horse-Radish*, *Fennil*, *Perfly*, *Broom*, *Gromwell*, *Daucus*, *Butchers-Broom*, *Cicers*, *Winter-Cherries*, and the rest, are not much depended upon by those that have made trial of 'em for four or five Months successively, though now and then one or other, that hath fancied a great relief, doth revive their dying Reputation. These and the like instances do aptly compare the practice of Physick to a Lottery, where one Fortunate Adventurer saves the sinking Credit of that Cheating Mystery, against a hundred blank Miscreants, by being proclaimed such by sound of Trumpet.

9. *To Madder*, and many other Vegetables is ascribed Opening, Stopping, Binding, curing of the Jaundice, removing Obstructions of all sorts, suppressing the *Menstrua*, Loosenesses, and all sorts of Bleedings, besides many other feats, that are contrary to each other. As for *Amulets* and other Transplanting and wonderful Deeds, they are appropriated to abundance of Plants, of which, and several Physick Golden Legends the Herbarists speak wonders, if you can believe them. As for my own particular, beyond forty or fifty Vegetables, tho' I have made trial of hundreds of 'em, I find no great occasion for them, and therefore shall supersede taking any farther notice in this place.

C H A P. II.

Of the Insignificancy of the Old and New
Philosophy.

1. **T**Hings in Philosophy and Medicine, which we do not know, are beyond all manner of Comparison more than those things we do know.

From this Axiom I do infer, that it is highly incumbent upon all, that would endeavour the advancement of Physick, to make a further inquiry into Diseases, their Causes, and Medicines to oppose them.

2. The greatest part of those things in Medicine, which we pretend to know, is conjectural, and uncertain.

3. Many, if not most of these things, which we do peremptorily affirm to be this, or that, to be caused by this, or that, or to cause and effect this or that, are, or may be proved, to be false, or erroneous.

These Positions being only my particular Creed, whereinto the weakness of my capacity hath been wrought by thousands of instances, I shall undertake to offer only some few, the shortness of my purpose no otherwise permitting.

1. Natural Philosophy is propounded under Two Heads, viz. *Physica generalis*, & *specialis*; that is to say, *General Natural Philosophy*, and *particular*. The former expounds in general terms, what a Natural Body is, namely, That it is a thing extended, moved, or quiet, figured, and so or so placed, situated, or posited. *Corpus Naturale est res quanta, mota, vel quieta, figurata, & taliter, vel taliter posita.*

2. What is all this but *Metaphysics*, namely, General Notions drawn from all particular Bodies? A Natural Body doth consist of Quantity, that is, Extension into length, breadth, and depth, mensurability,

ity, or divisibility into Particles, (it's much as one in the Original) of motion, or rest, of figure, and position, or situation. Upon these five Topicks follows a very long Cant, and of little more signification than the Predicaments, or *Materia*, *Forma*, and *Privatio*. But its a wonder to my crude Thoughts, Number was left out, since there is no compleat Natural Body, but doth consist of a definite number of Particles; however it may be presumed, that Number is comprehended under Extension, sc. *Quantitas discreta*.

3. The *Physica Specialis* depends upon the application of the forementioned, to every *Subgenus*, *Species*, and individual Body, and by that you are to know, what any particular Body is, of what it doth consist, and how each is differenced from the other.

4. What sound this modern Science of Bodies makes upon an Anvil, the following recital will inform you. A *Smith* being very sedulous in the management of his hot Iron, found himself much interrupted by the importunities of a begging Scholar, enforcing his Argument for an Alms of a small piece, with an Harangue of his Merits, arising from his being a *Master of Arts*, of I know not how many years standing, a *Doctor in Philosophy*, embroider'd with *Latin*, *Greek*, *Hebrew*, and abundance of other Giblets of Learning. The *Smith* to free himself of all this impertinence, asks, what that red hot thing was, he held in his Tongs, what it was made of, and what difference there was between that and Copper; to which the Beggar replied, it was Iron, a Metal, or a Business dug out of the Ground, that will melt, and can be hammer'd; and so is Copper, infers the *Smith*: Ergo, Copper is Iron. No Master, saith the Mendicant, there is a vast discrepancy between them in their insensible Particles, which are of different insensible Extensions, insensible Figures, insensible Positions, insensible Motions, and insensible Immobilities. Ergo, then saith the black Opponent, no two Bodies can be alike; two drops of Milk, of Water,

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Water, of Wine, or any liquid may be insensibly different. Thou art a most insensible Philosopher; a Man is not a Horse, a Sow is not an Elephant, Wood is not Cheese, and so of all others, because their Particles are of various insensibly Figures, Positions, &c. The most subtil Particles of the Forge fire, and the insensibilities of this *Arts Master*, had by this time fermented *Vulcan* into a torrent of Maledictions, crying out, you are a Cheat, to defraud the impotent Poor of what they may justly crave from the Charity of all Men; a lazy, slothful, unthankful Knave, enjoying the fruits of thy laborious Mother Earth, without returning the Gratitude of a days Plowing, or Dunging, which you are made for, an incorrible sturdy Beggat; See how the Sleeves of your totterdemalion Gown are cram'd from the Elbow to the ground with Pie crust, and pieces of Roast-Beef, and what's here in the bottom? a couple of silver Spoons, two laced Handkerchiefs wet, as if newly stolen off of some Hedge. You pilfering Dog, disrobethat Friar *Bacon's* Livery, off with your square Pancake Bonnet, and put on that old Coat of mine there, and this old Hat; blow the Bellows, and I will teach you an Art beyond all your Master-ships idle foppish Arts and Sciences, that shall get you an honest Livelihood, or else away to the House of Correction, that will soon drive out your insensible Particles, and make you sensible of what it is to Beg, Cheat, Pilfer, and Steal.

5. To what degree of satisfaction this Globular sort of Philosophy, pretending by its insensibilities to explicate the Principles, Causes, and Affections of natural Bodies, doth superate the old pedantick Sophistry of matter, form, privation, and the four Elements, together with their assigning the effects of natural Bodies to occult qualities, may justly be inquired into, since the answer is equal, that such or such things are caused by occult Qualities, or by insensible Particles, of insensible blind Figures, and unknown Positions. However, both the Globular and Peripatetick Philosophy afford matter sufficient to

Chatter, Cavil, and Trifle away the flower of a Man's time, as if design'd only for an Employment to divert from Idleness and Debauchery, not unlike sending Children to School, to prevent them from Carts and Coaches in the Streets or High-ways. Those do properly enough come within the saying of *Salust*, *Vitam silentio veluti pecora transeunt*; especially when continuing in an University, and possibly in a Fellowship, till their Bodies are grown rusty with Sloth and Laziness, and their Heads turn'd mouldy with grey Hairs; whose Studies indeed ought to have been determined in seven Years, were it only to quicken their Industry, and make way for other indigent Students to succeed them. A *Peacock* in all his gaudy Plumage is a Creature less stately and proud, than a *Master of Arts* treading to the Schools in his Formalities; and though Homage be paid him in his way thither by Undergraduates, and *Bacheleros*, his refined Manners will scarce allow his Mastership to touch the Angle of his Bonnet. *Clarissime Magister quare rides? Rideo, quia Magister sum.*

C H A P. III.

Of the Digestion and Indigestion in the Stomach, and the Vanity of the causes thereof.

It might be reasonably expected from the Tradition of so many Ages, and the Studies of six or twelve Months of so many *Masters of Arts* of seven Years standing or walking, before they assume the tusked Gown, that *Galen's Theory* would be render'd as *Diaphanous*, and demonstrable as *Euclid*; yet to my dim Oculatation, many, if not most of their Notions, seem still to be plunged in a dark *Chaos*; for as obvious is the Digestion of the Food in the Stomach may be, though it be the first Operation in the Body of Man, and therefore ought to be better understood, yet

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yet to me seems now, nothing can be worse explained, than by asserting the Dissolution into Chyle, *The 1st* to be performed by the natural and adventitious heat *concoction* of the Stomach, brought to it by the Arteries and *not per-* warm coverings of the Liver, Spleen, and other ad- *formed* jacent. A *Sharc*, *Sea-Wolf*, and other Fish, if Cre- *great or* dit may be given to all those Writers of *India Voy-* ages, have been found to contain in their Bellies a *Ferment* whole Man, being thrown over-board, with all his Cloaths upon him, great Joynts of Stinking Beef, with their huge Ox Bones in them, and Carcasses of Sheep with their Wool on their Back, all which were discerned almost digested into a thick slimy Juice, without observing any sensible heat, but rather coldness. The like may in proportion be instanced in a fresh water *Sharc*, I mean the *Pike*, whose vigour in digesting an Ox Paunch, and other Garbage, likewise Boney Fish of considerable bigness, without any sensible heat in his Bowels, or any steaming warmth, is an Argument that inforceth the former. The heat in the Maws of *Poultry*, which is inferiour to that of the Stomach of a Man, cannot be conceived in any wise proportionable, to dissolve the husks of *Barley* or *Oats*, (which notwithstanding they perfectly digest to an exact smoothness) and especially small Pebbles, which the extremity of Fire may melt, but not dissolve, and yet the heat of the Stomach of a Horse, though much more intense, doth make much less impression upon Grain, which commonly slip away untouch'd with their Dung. It hath likewise been decided by common Observation, that those who heat their Stomach at Meals with Wine, or soon after with Brandy, have a more difficult Digestion than others, who moisten their Victuals with small Beer, Wine diluted with Water, or only Water, as is usual to three fourths of the Universe.

Most Esculents seem to me to contain some Gummous Juice in them, that tieth their parts together, *Water* which Water will readily dissolve, and Wine, or *v. p. 26.* the Spirits of Wine do harden. This Gummous
B 2 clammy

clammy juice being dissolved, the parts which it cemented and kept together must necessarily fall asunder into a sort of Batter. But where the parts of Alimentary Substance are cemented together by a resinous Juice, then most certainly Wine or its Spirits would more readily dissolve them, and Water would harder them.

Fish.

Fish is apt to be hardened in the Stomach by drinking Wine upon it, and consequently is longer in its Dissolution, as appears in many that are sick at their Stomach, or very uneasie and heavy in the Digestion of it; whereas those that drink only small Beer, or Wine and Water upon it, digest it very easily. In the Northern Parts, as *Holland, Zealand,* and Maritime parts of *Germany*, where People do very much sustain themselves by eating Fish; they generally drink very small Beer upon it, and notwithstanding digest it easily, grow strong, and impinguate. Likewise its observed, that Fish that's Boil'd with Wine and Water, as some do out of Luxury, is hardened, which rendring it more solid and fibrous, gives the gustative part of the Mouth the most delight in the chawing it, though greater labour to the Stomach to digest it; whereas being Boil'd in Water, becomes soft, and more easily digestible. But Wine drunk two hours after, doth much promote the fermentation, (that as I said before arrives towards the latter end of digestion) and distribution of the Chyle through the alimentary or milky Vessels. After all, I do know, that use and custom doth much prevail in that part; and therefore those that are from an ill Custom used to drink Wine upon Fish, are apt to be sickish without it, tho' with it they are much longer in digesting of it than Flesh Meats.

Fish seems to contain a very strong gummy Juice, a strong Glue, (*ichthiocolle*) being made out of it, and therefore is much more easily dissolvable or digestible by Water, or waterish Liquors, than by Wine, or other strong Drinks.

2. Neither am I convinced, that those who ascribe the Energy of Concoction to an Acid Ferment, have in any wise hit their Mark; for considering fermentation imports properly an insensible, and in some things a sensible small ebullition or simmering, of any natural, or artificial, mixt, or compound liquid, soft, or consistent Body, which by rarefaction, or widening and opening the close parts, doth let out, or expel such Particles or Bodies, that are Heterogeneous, whereby a depuration of the said mixt body is attained: And if this rarefaction, or widening, and multiplying of the pores of the Body, be protracted to too long a continuance, or performed with too great violence, the most subtil particles of that body, which are the chief constituents of it, are forced, or let out together with the Heterogeneous, whereupon a dissolution, putrefaction and corruption of the whole mixture must necessarily ensue, as appears in the fermentation of Wine, Beer, Cider, &c. *Ferment* which being rais'd too high, or continued too long, *lahon* doth most certainly convert them into Vinegar. *Dow* Dow by yist or levain is huff up, (or in the common phrase doth rise) or rarefied, that is, opened, or widened in all its pores and oft multiplied: whereby the most subtil particles, or matter of the fire (being the heat of the Oven) is let in, which together with the constituent most subtil particles of the Dow do expel the nitrous, and other heterogeneous flying parts, which otherwise would prove very offensive to the Stomach, and in some be render'd indigestible. Now if the Dow continue too long in rising, or rise too fast, it soon falls, and is apt to turn Soure, and being then put into the Oven, can never be well baked, and doth in a short time turn mouldy.

3. To say then, that Bones, Grissels, or any other hard matter, is rarefying in a Dog's stomach, meaning thereby fermenting, and consequently digesting, to me seems a very improper way of speaking; for Fermentation doth in my Opinion ever follow Solution, in order to depurate and render homogeneous, what is dissolved; how then can those Bones be said

to be fermenting; before they are dissolved and digested.

Spittle

A. It is to the Spittle many Physicians of good Fame do attribute the chief, or rather sole power of dissolving the Victuals into Chyle, by raising a Fermentation in the Meat and Drink, that's swallowed down into the Stomach; for being chewed, crush'd, rowl'd, and turn'd about in the Mouth, it's mixed with such a proportion of Spittle, which by its Spirits and saline Particles, assisted somewhat by the native and ambient heat of the Stomach, penetrating through the pores of the Victuals, raises a sort of a small ebullition, whereby they are dissolved. But if you consider the nature and use of Spittle, probably this matter may appear otherwise, Spittle cannot properly be called an Excrement, which is of no use, and ought to be thrown out and expelled; but a Recrement, which is of use, and ought not to be expelled, unless it be abounding, and after it hath performed what its intended for. *Horses, Cows, and other Animals* have their Mouths and Throat always moistned with Spittle, but which is seldom or never expelled by them by sputation, as very oft it is by the Humane kind, when its become superfluous; which is an Argument, its no Excrement. The use

The use

of it to me appears, to moisten the several parts of the Mouth, Gullet, and Windpipe, and to keep them constantly glib, smooth, and soft; for otherwise the Tongue and Jaws by their frequent motion, and the steems that continually pass out of the Lungs in the expiration, would render those parts so dry, stiff, rough, and unpliant, that they would become useles. The Windpipe would be so corrugated and contracted, that it would put a stop to the respiration; the Gullet would likewise through want of Spittle suffer such a streightning and roughness, that it would be utterly incapable to give passage to the Victuals. Touching the nature of Spittle, it is in no wise different from Lympha, which is contained in other Lymphae ducts, the Ductus Salivales being no other, and as long as it continues in the said Duct,

The name

its

its much fuller of volatile saline Spirits, which renders it limpid, fluid, and thin; but being come to the Mouth and the other parts, out of the said *Ductus*, those volatile saline Spirits do soon evaporate, and fly away, whereby the Spittle becomes thick, mucilaginous, and oft frothy, by the admixture of extraneous Air, and other slimy Particles, it meets about the Mouth and Throat. So that if Spittle be of this nature, it must rather hinder Fermentation, and consequently the pretended Solution into Chyle, which that it doth, is manifest in those Melancholians, that are commonly termed Spitters, who generally have a very bad Digestion. But suppose a Man that abounds with Spittle, should spit a quantity of it warm out of his Mouth into a warm bolt head hermetically closed, containing a small bit of Meat that had been well grinded in a warm Mortar, and then this mixture being put into a warm sand Bath, do you believe, here would happen either a Fermentation, Ebullition, or Solution into Chyle, though it were to continue there six Weeks? Or, suppose a Man should swallow several great lumps of Flesh without chawing of it, or mixing it with his Spittle, do you not think he would digest into a Chyle, though it might take up some longer time, than if his Meat was chawed? What Spittle doth a *Sharc* or *Pike* mix with those great pieces of Flesh and Bones, which they swallow without chawing, and yet digest them sooner than any other Creature could, as they are in the Water?

4. That the *Lympha* in all the *Lymphic ducts*, (and the Spittle also though more sparingly) is perused with some remaining proportion of volatile saline (that is Animal) Spirits, appears to me by the similitude of Argument, for establishing the circulation of the Blood out of the Arteries into the Veins, and thence into the Arteries again. The chief motive to me being, that the Heart throwing at every Pulsation such proportions of Blood into the Arteries, these must of necessity swell to an extremity and burst,

were there not other Vessels, namely, the Veins, ready to receive and unload the Arteries; as for the swelling of the Arteries on the side towards the Trunc, and of the Veins towards the Extremities of the Body upon a Ligature made on any of the Joints; or the Arterial Blood upon Arteriotomy flowing from the Trunc, and the Venal Blood upon Phlebotomy flowing towards the Trunc, would scarce be persuasive enough to me to receive that Doctrine, since other Reasons might be given for those different Intumescencies upon a Ligature, or the different issuings out of the Blood out of the Arteries and Veins. In like manner I do suppose, that the *Nervous Lymphs*, which is the Vehicle, and containing Liquor of the Animal Spirits, is always flowing or dripping from the Brain, and *Medulla Spinalis* to most parts of the Body through the Nerves; and cannot be supposed to return back again naturally, which therefore must of necessity extremely swell, and stiffen the Nerves, unless received and disburden'd by some other Vessels, which in all probability must be the *Lympha-ducts*, containing in substance, tenuity, clearness, penetrative vertue, and other qualities, a *Lympha* not unlike the Gleet, that distils from a wounded Nerve. Moreover, considering the valves in the said *Lympha-ducts*, opening towards the Trunc, and shutting towards the Extremities, doth add to the apparency of the forementioned supposition, implying there is a circulation of the Animal Spirits and *Lympha*. The fore-said *Lympha* being received by the *Lympha-ducts*, must necessarily be much impoverish'd in its volatile saline Spirits, and consequently have lost its power of supporting of motion and sense, though otherwise of very great use, almost in the same proportion, as the Blood in the Veins hath lost of motion, and is very considerably retarded, in respect of the quick and rapid motion of the Blood in the Arteries.

5. Neither can I conceive, that the Stomach is capable to contain any Acid Juice powerful enough to dissolve Bones, Grissels, Sinews, Skin, and all sorts of Flesh without hurt, and danger of perforating its

Mem-

Membranes, being much softer and easier to be dissolved, than Bones or Sinews. If you pour the strongest Vinegar, or *Aqua fortis*, upon those Edibles beforementioned, and set them over any degree of Fire in a Vessel, stop'd as close as if Hermetically Sealed, for the space of ten or twelve Hours, you will scarce find any Solution, or at least not comparable, to what a sound Stomach performs in two or three Hours. Moreover, where any Person by sower Belches perceives his Stomach to be charged Belches with a sower Juice, his Victuals will scarce be digested, or dissolved into a good Chyle, but into that sort of slime, which Physicians term *Cruditus acidi*. And I have frequently observed, that many upon Drinking sower Beer, or eager Wines, or using sower Sauces to their Victuals, have not only undergone a very laborious and painful Digestion, but oft-times been forced to throw up their whole Cargo.

6. The Stomach doth sometimes receive such sorts of Aliment, as Pudding, Pancake, Custard, Tansie, Minced Pie, Plum Broath, Plum-Cakes, and the like, which in most Persons will ferment, and be relieved to a degree, that will huff up, distend, and swell not only the region of the Stomach and Hypochonders, but also their whole Belly, to an extension and uneasiness, that will oblige them to unbutton, and widen their wasteband. Those recited, and the like Edibles containing a fermentative Spirit in them, seldom fail in fermenting, during which, as it suspends, or at least retards the Concoction, (notwithstanding they seem matters so easily digestible, and incomparatively less difficult than Beef, Pork, &c.) yet the solution cannot, or is seldom perform'd with vigour, until the foresaid fermentation ceases, which is perceived by the subsiding and relaxing of their drum Bellies. Hence it is, that many do find, they cannot digest so easily upon drinking bitter or sower Small beer, or strong Ale, Beer, or Wine, as a smallish smooth Beer, Water, or Wine and Water, because the former contain such a large proportion of fermentative Spirits. And it is upon the same consideration,

*new Drink
bad for
Digestion
v-19-13.*

filtration, that new Drink not being sufficiently cleared of its yist, and other feculencies, proves so offensive to Digestion; Besides, strong Beer, Wine, and Brandy, also all sowre Drinks do harden the Victuals in the Stomach, which Water and small Drinks soften and dissolve, as you may read, together with the Reason thereof, in the 2d Paragraph of this Chapter. Nevertheless, to some Constitutions that are slabby, cold and moist, and accustomed to strong Drinks, this may be much more agreeable.

Mercury

7. Since I can in no wise apprehend the dissolution of Victuals in the Stomach to be caused by heat, fermentation, or any corroding acid Juice, no more than Gold, which the extremity of heat will melt, and not dissolve, nor will a strong corroding Aqua Fortis touch it, yet a small proportion of fluid Mercury, (which in that form hath no manner of a corrosive sharpness in it) with the assistance of a very little warmth, doth in a short interval of time very expeditiously and potently, by its most subtil Particles insinuating into its Pores, though more close than in any body whatsoever besides it self, tare it asunder, dissolve, and divide it into the minutest Particles. In the same manner I do conceive, that all sorts of Victuals, be they hard or soft, are as easily and readily digested in strong and sound Constitutions, by the most subtil saline Particles of the Body, (which are the Animal Spirits) steaming in clouds out of those large Nerves of the sixth pair, that are inserted into the Stomach, and their numerous branches that are disseminated through its Tunics, which forcing into the pores of the alimentary Substances, tare them asunder, divide, and dissolve them into the minutest Particles, and being mixt with the moisture of your Drink (especially small Drink contributing much to the Solution of the gumous matter, that very probably is contained in most sorts of Edibles, as hath been hinted before) are converted into that Juice we call Chyle; Hereunto the warmth of the Stomach derived from the Arteries, and cirrounding Bowels

Bowels, is very assistent, though it hath been oft observed, that some whose Stomach hath been commonly felt very cold by themselves, yet nevertheless had a very potent digestive faculty, that would subdue the hardest and rawest of Meats.

The colour of Chyle is commonly of a greyish white, occasioned by the rarefaction of its body into wide pores, which being adapted to admit the light from without copiously to a great depth, makes it appear of a whitish colour; whereas the density of a body disposeth it to blackness, by excluding the luminous particles in the Surface. The Objection that Gold ought to appear black, because its Body is the most condensed of any, is easily answered, by supposing, That if its Body were absolutely condensed, it must be black; but granting also that it must be indued with some pores to admit a proportion of luminous rays, which I will only suppose to be extremely white, and white in some proportion added to black, renders a yellow, and if equal, in many things makes a red: But observe, that part of this Paragraph is only a *Supponendum*.

8. Now when the inward coat of the Stomach ^{too much} (*Tunica rugosa*) is cover'd with too much slime, (for ^{slime in} its necessary it should be cover'd with a little, to defend it from the sharpness and roughness of all sorts of Victuals it receives) so as to stop and plaister up the pores of the Nerves, whereby the foresaid most subtile saline Particles are in some proportion hindered from flying out, the digestion becomes slow, laborious, painful, and difficult, converting a slimy Chyle, which in process of time doth turn into many sorts of Diseases.

9. Of those that drink thick, austere, or adstringent Wines at, or soon after Meals, or close their Repasts with Quince-Marmelade, Chestnuts, Almonds, or the like, I have experimentally found, that in many, to whom either the lessening the use, or wholly weaning themselves from those Things, hath been advised, their digestion hath been soon reduced to its former Vigour, which before, by the continual cloying

*Enemies
to Digestion
v1813.*

closing of the Pores of the Stomach-Nerves, was exceedingly debilitated, by the foresaid clogging, and adstringent things.

10. It is likewise as consonant to experience, that those who usually drink any Wines, not being diluted with Water, or that commonly conclude their Dinners or Suppers with Banquets of Sweet-meats, Custards, Cheescakes, Creams, and Gellies, do weaken, and intime destroy their Concoction, so as few of them are found to be long livers; because those before-mentioned materials containing a fermentative Juice, by raising a Fermentation, do extreemly interrupt and impede the dissolution of Aliments in their Stomach. Those Fermentations in the Stomach, upon Fermentative Edibles, are frequently causes, that produce those flushings in the Face soon after Meals, and at other times in many Women, and some Men, that have weak Digestions, and contain something in their Stomachs that is Fermentable, against which drinking of Water, or Water mixt with very little Wine, hath oft proved an effectual Remedy.

Water v
11.17

The benefit
of changing
Malt-Drinks
for Water

11. Some that have for several Years been afflicted after Meals with pain and disturbances in their Heads, drowiness, uneasiness in their Limbs, palpitations, faintnesses, belches, huffings up, and tensions in their Hypochonders, and Bellies, have been totally cured of all their turbulent Symptoms, by throwing off all Malt-drinks, and Wine, and gradually using themselves to drink Water, when all other Remedies were so far from giving them relief, that they rather aggravated their Complaints. But what is more, it hath been observed, that Chronical Coughs of many Years continuance, have been not only removed, but perfectly cured, by exchanging of Malt-drinks and Wine into Water, or into Water refresh'd with a little Wine. And those that have travell'd through Germany, and the Low Countries, might have observed, that the strongest and healthfulest Bodies are found among the Boars, who for their ordinary Drink are scarce acquainted with any thing but Whey, or clear Water, which contributing so much

to perfection of Digestion, may very reasonably be esteemed the true cause of their Health, Vigour, and long Life. These and many more like instances do force this concession from me, that the choice of Drinks is of greater importance than of Edibles. When Fermentative Drinks, as strong Beer, and Wine, shall disturb and retard Digestion, and cold Water which suppresses Fermentations (as appears in many Hysteric Women, that by drinking a Glass of fair Water, do in a moment turn off a fit) shall in many promote and enliven Digestion, how can it then be thought, that Digestion is caused by the heat of the Stomach, or by Fermentation?

*Old Water
v p. 11-17-20*

12. Though drinking Water hath on several occasions proved successful to admiration, yet particular regard must be had to the Climate, season of the Year, Age, Sex, Custom, and other Circumstances; for should drinking Water be recommended to one, who from his Infancy hath been used to small Beer, and living in a Northern cold Climate, in a rough friezing season, and of a tender Constitution, very unhappy consequences must be expected from such unadvisedness. Wherefore where change of Drink shall be judged necessary, from the continual use of strong Beer, or Wine, you may descend to small Beer, Barley-Water, clarified Whey, a weak Mead, thin Grewel, or the like, in Winter; and to some others to Spring Water in the Spring and Summer, which may prove yet safer upon premising some small Bleeding in replete Bodies, and gentle laxatives in foul and depraved Constitutions.

*a caution
as to drink-
ing Water*

CHAP.

CHAP. IV.

Of the passing of the Chyle into the Guts,
and its Depuration there.

1. FROM what is here incidently discoursed, I return to a farther Explication of the Digesture of the Stomach, where the Victuals being dissolved, and by continuance of Concoction smoothed, and brought to an Equation, the Chyle doth then require depuration, which is a separation of the thinner and finer parts from the groser and seculent, by a fermentative Juice, which I suppose to be an Acid, joyn'd to igneous Spirits, by an *intermedium* of some glutinous emplastick, or gummous Particles, as may be discovered in Yist, or Levain. This Fermentation (I will only suppose) happens at the close of the Digestion, and begins to rarefie and huff up the Chyle in the Stomach, whereby the lighter and thinner parts become rising and swelling, and gradually work over the *Pylorus* into the small Guts, the Stomach in the same proportion contracting it self into a lesser and shallower compals, as it is emptying and growing less full, and less distended, by which means the trajection of the Chyle is facilitated, until there is nothing left, but a gross and seculent acid Juice, serving to assist as a dissolvent to digest what may remain more difficult, be it some grissly or sinewy, or other tough hard part of the Victuals, Pye-crust, or any thing else that is more difficult to digest, than what is already wrought over the *Pylorus* into the small Guts; which being performed, the same acid Juice by its sharpness pricks and stimulates the Fibres of the Stomach, (contracting it self into a very narrow volum) throws that also, together with what it hath dissolved, over the *Pylorus*. Whence I do give my self a probable reason; why the latter part of the Dige-

Digestion, and at the beginning of the fermentation of the Chyle upon its arrival in the small Guts, is always acid, and why at that time we are subject to soure Belches, and how it happens, that the fulness and distention of the Stomach, which most are sensible of at the end of their Meals, doth gradually lessen, and as soon as the soure appears is quite allay'd, and the digestion finish'd. And if I attribute not too much to fancy, I do observe, that many Persons towards the end of Concoction, do perceive an uneasiness of heat all over, especially in their Faces, extremities of their Hands and Feet, but particularly those that are weakly, as Hypochondriacks and Hystericks, who about that time, and a good while after, are subject to have flushings in their Faces, and their Symptoms (as faintnesses, palpitations, roaring Winds, &c.) set into motion; all which to me seem to be occasioned by the foresaid fermentation, through the quickness of motion of the fermentative Particles, exciting a heat and warm steaming *Effluvia*, rarefying the whole Mass of Blood and other Liquors.

2. Upon the dripping of the Chyle into the small Guts, the Fermentation is considerably augmented, by the meeting with the excrementitious Juices from the Glanduls of the *Pancreas*, and *Mesentery*, mixt with Gaul from the biliary Vessels, whereby the Chyle is wholly depurated of all its feculencies, which being separated, are term'd Excrements of the Belly. That there is such a fermentation in the Guts, appears by the tension and intumescence of the Belly, in some more, in others less, which may be perceived 2, 3, or 4 Hours after Meals, according to the expedition of their digestion, separation, and subsequent fermentation.

3. As I am not very flexible to recede from the general opinion of the Antients and Moderns, importing, that the first Concoction is performed, either by vertue of the heat of the Stomach, or by force of Fermentation, as it is asserted by most of the learned, that were Cotemporaries with the famous

v. p. 11.

Dr. Willis, and others that do succeed him: Neither am I willing to be thought so criminal, as to be contumaciously guilty of Heresie in Physick, yet its pardonable, if not allowable, to be Schismatical in ones proper opinion, which in all Mankind is free, and not to be compelled; and therefore I do declare, that nothing but late Experiments of no small number, do induce me to retract my former sentiments of this, and many other matters in Medicine, as firmly believing, what I have expressed concerning the first Concoction, and Fermentation, as that the Sun is the cause of Day-light: though at the same time its very possible for me to be under a mistake. But whether all this be really true, or only in appearance, I am thence provided with the Solutions of hundreds of difficulties, offering themselves on those Subjects, and the full and plain discovery of the causes of many, if not most Diseases, and what is beyond all, not unsuccessfully conducted in the practical part; which to me is a satisfaction beyond what I have met with, either in conversing with Printed Authors, or with Men reputed very learned and experienced in the Faculty.

Stomach 4. Upon the well beginning depends the well finishing and compleating, the Stomach being the beginning of the whole Body, it is from the true knowledge of its Fabrick, Constitution, Action, or Operation, the knowledge of the Constitution of all the Bowels, their Actions, and Operations of the whole Animal is derived. The Stomach is the only and true tuning part of the whole Body, which being well or ill tuned, causeth a Harmony or Discord of all the Bowels. The Stomach being strong and vigorous, performing its Office, or Action, and Operation in perfection, renders the Body Strong, Healthful, and long Liv'd: but in proportion, as it is defective in any part of its Office, Diseases in it self, and all other parts of the Body are engender'd, answerable to the degree and quality of its defect, and to the dependency all the Bowels have on it; for being the Laboratory of the whole, whatever is ill prepared

prepared here, cannot be mended afterwards, by any of the succeeding Bowels, the Chyle being vitious or corrupted, can never be converted into good Blood, nor that into good Animal Spirits, no more than you can make good Butter or Cheese out of soure or corrupted Milk. And as most, if not all internal Diseases, (Endemic and Epidemic excepted) are Originally produced in the Stomach, they are likewise to be cured by the Stomach, internal Remedies exerting their first and stronger force upon it, the virtues whereof it afterwards transmits to the part Diseased. Neither is it to any purpose, to pretend to cure any internal Disease, without first of all having put the Stomach into good order, which done, most Diseases are ready to go off of themselves.

5. The Stomach bears an adequate Analogy to the root of a Tree, and may properly enough be called the Root of a Man; for as the root of a Tree is the beginning of it, receives or draws the juice of the Earth, to prepare and convert it into Food for the Trunc, and all the Branches, and being well digested, transmits it to all the parts; in like manner, when the Tree is observed not to be thriving, or the Branches to be decaying, changing of colour, withering, or dying, where do they look for the Cause, but at the Root of the Tree? Even so is it with the nourishing of the parts of the Body, and the Diseases they are subject unto, in relation to the Stomach.

C

CHAP.

C H A P. V.

Describing Medicines to preserve Health, and their Preparations.

The occa-
sion of
the Weak-
ness of
Stomach.

Against
Hot Brandy
and strong
things

The only
means to
strengthen
the Stomach.

Elixir
Proprietatis

BY the deduction from the preceding Discourse, my Opinion persuades me, that the weakness of the Stomach, and its faintly performing its Office, is only occasioned by the debility of the Stomach Nerves, and its numerous Branches, by being plai-ster'd up by too much Fleam, gross acid Dregs, indigestible Meats, or offensive Drinks, or other matter admitted into the Stomach, which by lodging there too long, assume a corroding Quality; or by too much heat, and too little moisture, are converted into a noxious crudity. This supposed, I do believe, and have experimentally observed, that all those Corroboratives of the Stomach, whose virtue is commonly asserted, to consist in a gentle restrictive and warming Quality, whereby those slimy Humours are more firmly cemented, such as *Aromaticum Rosatum*, *Caryophyllatum*, Cinnamon-Water, those hot spicy Brandy-waters, a red Tincture of Roses, Methridate, Treacle, all those Compound Electuaries framed of heating Conservees, Condit, and Peptick Pouders, are so far from contributing the least strength to the Stomach, that rather a contrary effect hath ensued, and being long continued, do carry danger with them. The only means I have hitherto found to strengthen the Stomach, are proper absterfivive Medicines, gently wiping off those clammy substances from the tunics of the Stomach, and the terminations of the Nervous branches, and among these I have not yet detected any thing, equal to a good *Elixir Proprietatis*, well prepared by a long Digestion in a Sand-bath, the proportion of the Ingredients being somewhat altered from the common, and something also substituted in place of the Myrrh: A drop of this shall exceed a pound

pound of Peppick Pouders, Electuaries, and other
top Stomachicks. Do only keep your Stomach clean,
you will certainly preserve its Strength, and prevent
most Diseases.

2. It is not to be understood, where a heap or
weight of Crudities is accumulated, so gently ab-
sterging a Remedy can have a power to disengage
the Stomach; no more than a wet Mop can be sup-
posed to rid a Room of a heap of Rubbish, in which
case something more stimulating is required, that may
be used in all Seasons of the Year, be it sultry or
friezing, without the inconvenience of confinement
to Diet, or warmth of the Air, and without offence
to the Stomach, or putting the Body into any dis-
order, to which purposes, the Pill I here now de-
scribe, I have Experimentally found to be effectually
answering in most respects.

3. Take one Ounce of the clearest shining Aloes, *Stomach*
which at the Druggists will cost about a Groat, or *Pills*
sometimes Six-pence an Ounce, and which being free
from any considerable dross, will not require any de-
puration. Powder it in a Mortar, covered over with
a brown Paper, having a hole in the middle for a
passage to the Pestil, to prevent the little pieces of
the Aloes from leaping up, while you are in the be-
ginning of your pounding; for afterwards the Paper
may be removed. Observe to anoint thinly the bot-
tom of the Mortar and Pestil with a little Florence
Oil, to keep it from sticking to the bottom. When
its reduced to a gross Powder, by grinding it with the
Pestil you must bring it to a smooth fineness. Put
the Powder into a small glazed flat-bottom'd earthen
Pan, that will contain about half a pint, pouring
upon it about a quarter of a pint of fair water, where-
in hath been dissolved two Drams of Spanish Juice of
Liquorish, which is done by slicing it very small,
and setting the Water in a Porringer over a gentle
heat; place this small earthen Pan into one some-
what bigger, having Sand in the bottom to the height
of an inch, and afterwards filling it up to the brim.
Set them over two piles of Bricks, of three or four

Bricks high, laid flat. The Piles must stand at such a distance, that they may reach the edges of the bigger pan, to support it. Then make a moderate fire of Charcoal under it, to heat the Sand, to cause the superfluous moisture to be evaporated, untill the Mass is brought to the thickness of Honey. Or you may by dropping two or three drops on the back side of a Plate to cool, make trial, whether it be reduced to the consistency of Dow; for if it be overdone, the mass being render'd brittle, will not only lose most of its virtue, but also its aptness of being framed into Pills; and if it be not evaporated enough, it will be sticky, and not apt to be brought to a Mass.

4. The lesser Pan being taken off, when the evaporation is sufficient, before its quite cold, you must with a *Spatula*, or slice, take out the Mass, and between your Fingers, being a little anointed with *Florence Oil*, or *Oil of Sweet Almonds*, to prevent the sticking, rowl it into a round ball, which you may keep in a *Sheep's Bladder*, being likewise thinly wetted over on the inside with the same Oil, for many Months, if necessary, without any great impair of its vertue.

5. A small piece of this Mass being form'd into six, seven, eight, or nine little Pills, of the bigness of a Pepper-corn, is a Dose sufficient to give two or three motions, according to the number of Pills, and the loose or coltive Constitution of him that takes them. The safety of this Medicine adds much to its Character, since the taking of one Pill or two more or less, imports as little hazard, as the taking it very oft, or in any kind of Season, be it hot or cold, unless your Body be subject to a Looseness, or the Hemorrhoids, or your Constitution be thin, hot, and dry.

6. By the addition of the Juice of *Liquorish*, the Mass is design'd to be obtused in its too pungitive quality, whereby its apt to raise the Piles, and becomes somewhat less precipitating, and consequently hindered from lessening expectoration, which

Dose

Caution

Piles prevented by the Liquid.

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which in this Climate is so necessary in Coughs and Phthysicks.

7. The same correction may also be attained, by dissolving the same proportion of clean *Aloe*, in half a pint of Juice expressed from the contusion of an Ounce of *Bugloss*, or *Borrag* Roots, or a large handful of their Leaves, and stirring half a pint of warm Water with them, in the bruising, and clarified by subsidence, in letting it stand in a Cellar for a day or two, and pouring it off the Fæces or Dregs in the bottom. This evaporated in the same manner will produce a Mass, almost equal in goodness with the former.

8. I cannot hitherto observe, that the use of these Pills, though frequently taken, either once in a week, *Stomach* by reason of its degree of weakness in the digestive faculty may require, doth in any wise debilitate those, that may properly use them; but on the contrary, rather corroborate their Stomach, by assisting it to throw off that heap of rubbish, and crude Humours, which those that eat and drink plentifully, and either live sedentary Lives, as many that are Educated to Professions, or others that are not used to exercise or labour, are subject to engender, especially if naturally of a weak Constitution, or of an advanced Age.

9. For three or four days succeeding the use of these Pills, a good *Elixir Proprietatis* taking Morning and Evening, in a proportionable Dose, hath by my Observation ever had the good effect of preserving Health and preventing Diseases.

10. To what I have mentioned touching the advantages of a familiar Acquaintance with those Mundifiers, both the Pills and the Elixir, the inquiry I made of a fresh colour'd vigorous *Dutch Burgher*, I casually met in my Travels, who exceeded the Age of fourscore, may in some wise add a confirmation. He did likewise aver to me, *Bona fide*, That for 40 Years last past, he had seldom or never omitted once in a fortnight, or sometimes sooner or later, according

Sen'd
Prunes

to the direction he received from his marks of fulness and uneasiness, to cleanse with Seny stewed with Prunes, from which custom he did derive his capacity of Eating a hearty Meal of any thing he liked, without advising of the wholesomeness, or easiness of Digesture, and at times of drinking a Glass of Wine to an Altitude, to accommodate his Friend.

Bleeding

11. As lesser Purgatives do rather contribute strength by their consequence, so the greater being properly used, do not carry that danger with them People commonly imagine, since I have known many, that for three months successively, have taken strong churlish purging Pills every morning, some few days only omitted; I may say, some have swallow'd a pottle of strong Purgative Pills in a few years, and lived in full health to a remarkable Age, and not without a Libertine Mode of Eating and Drinking, Whence its apparent, that the toughness of the Nerves, upon which the strength and action of the Bowels only depend, doth suffer as little by the strongest Purgatives, as an India Cane by a thousand times bending, which notwithstanding will recover its former figure and full strength. It were to be wish'd, that Bleeding could be administr'd with the same safety, of which it may be justly said, that the Lancet hath, and doth in proportion, kill more Men than the Sword; and it's as commonly observed, that those Physicians who do so generally practice it, know little else what to do; and on the other hand, their Patients are as rash and prodigal of their Lives, to submit to their heedless Advice. As the first and second Bleedings may be of great use to many Bodies and Distempers in the colder Climates, so I have ever remark'd, that the third and fourth have proved as detrimental, and not seldom fatal; Having observed, that with two Bleedings at most, succeeded with other Remedies, incomparatively more continual Fevers, Rheumatisms, Pleurisies, and Pthyicks have been cured; then have survived those frequently reiterated Bleedings, which in common Practice usually give the parting blow.

12. Its a consequence an Ideot inferrs, because a Person having been blooded eight or ten times in a great Distemper, doth recover his Health, he owes the benefit of it to the bleedings, whereas it ought rather to be said, neither the Distemper nor Bleeding could kill him.

13. To return from this Deviation to the use of Purgatives; tho' those that are strong, are required in great Diseases, *Strong Purges* they ought to be avoided in lesser Distempers, or where prevention is only intended; for all Purgatives deriving their power from a specifick fermentative Spirit, or Salt, by rarefying or rusting up morbidick Humours, and afterwards by stimulating the Nerves to throw them off alter Separation, when strong ones are taken, where no Disease is engender'd, they are apt to cause one by fermenting, or rarefying and stimulating the laudable Juices or operating upon those dormant humours, which by strength of Nature, or assistance of mild preventing Purgatives, and absterfive Corroboratives, might easily have been worn off. Thus it hath oft been observed, that some by taking *Extractum Rudi*, have soon after fallen into continual Feavers; others through a preventing care to avert the Gout, have immediately fallen into a violent fit, upon taking *Elixir Salutis*, *Bromfield's Pills*, *Golden Spirit of Scurvy Grass*, or the like empirical Medicines, which is not all the mischief such sort of Purgative vendibles have occasioned, as being unskillfully invented, and more unskillfully prepared, since not a few have been thrown into mortal Diseases by the use of them. Yet I stand more amazed at the Folly of Mankind, that is, so easily allured by vain boasting and mendacious *Laudanum* *Encomia* upon *Laudanum liquidum* plainly prepared, or disguised by a solution of *Opium* into volatile oleaginous drops, to the frequent and constant use whereof, a Man being once debauch'd under pretence of ease, and quieting himself of a few Gripes, Fumes, or Vapours, he can no more leave it off for a fortnight, a week, or a day, than a Labourer his Bread and Cheese; or a Man throw off his Coat and Waistcoat

in a hard Winter, or a Brandy-Drinker forsake his Spirits and return to small Beer. Using ones self to such plain or disguised Opiates, is like making a contract with the Devil, to live easie and well for a few Years, upon condition he shall have his Soul to torture afterwards: For certain it is, that the familiar use of Opiates, after some Months, or very few Years, either doth wholly desist from being friendly, by suffering your trouble or Distemper to return in a more horrible manner, or create a new one, incomparably worse than the former, or strangles you with an Apoplexy, or some other soporouse Distemper, which is most amply proved by those, that make *Opium* their Sacred Refuge in every fit of the Cholick, Gout, or Stone, who seldom or never fail of a speedy Exit, by some incurable Disease of the Brain, in very few Years; and those that do advise such a lethiferous remedy for a common use to their Patients, have a greater title to a Halter, labell'd with an Inscription of *Mathew's Pills*, or *Pacifick Drops*, than those that murder a Man in the High-way. In short, *Opium*, *Laudanum liquidum*, *Diacodium*, and all other strong narcotic Medicines, do destroy the Brain and the Nerves, and consequently occasion weakness and tottering of the Stomach, Nerves, Numbness, Palsies, Lethargies, loss of Memory, and dulness of Understanding; diminish and deprave all the Offices, Actions or Operations of the Bowels, suppress the Appetite, occasion a wildish countenance and paleness, and at last upon long usage usher in Death. In what manner those fits, or Gout, Stone, Cholick, and other sharp torturing Gripes, appear to me to be occasioned, and by what causes, I shall give my opinion after this following Interlocution.

1. I have in the preceeding Discourse given you my Sentiment, that to preserve Health, and prevent Diseases in valerudinary Constitutions, (for strong vigorous Bodies stand in no need of other preservatives, or preventives, than moderation in their Non-naturals, the knowledge and sense whereof, Nature hath implanted in all other Animals, as well as in Men,)

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Men,) no better ways and means can be used, than applying at certain intervals, to those cleansers or abstersives here before mentioned; as for *Aurum Potabile*, or any pretended *Lapis Philosophorum*, or all *Faber's Quintessences*, upon their just trials, they have been found to contain less vertue in preserving Health, than a good Chicken Broth.

15. You may remember a caution was given in one of the foregoing Paragraphs, interdicting all Aloetics to thin, hot, and dry Bodies, and such also as are subject to the Hemorrhoides; and in regard that such Constitutions, especially when promoted in Years, do also require the keeping the Stomach, clean; and free from all slimy and nidorous crudities, I do recommend a good *Lenitive Electuary*, not the common, which is so ill contrived, and filled with rubbish. This following description gives you the form of an easie, gentle, and effectual Laxative.

Take four Ounces of the best *Cassia Fistularis* newly drawn, and evaporated to a consistency, (the manner of doing it you may read in a Treatise, called, the *Family Physician and House Apothecary*.) *Rhubarb* powder'd, white *Meehoacan* grated and powder'd, and clean *Rhenish Tartar* powder'd, of each a quarter of an Ounce, sweet *Fennil-Seed*s powder'd, a Dram and half, Syrup of *Marsh-mallows*, as much as will suffice to make it into an *Electuary*. You may take hereof a quarter, or half an Ounce, or sometimes a whole Ounce, dissolved in a quarter of a pint of thin Grewel, Barley-Water, Posset, or thin Chicken-broth, once in a week, fortnight, or a month, according to the direction given concerning the Aloetics.

16. *Rhenish Tartar* I do prefer for a Laxative, far before Cream of *Tartar*, which doth lose all or a great part of its solutive vertue in the preparation.

CHAP. VI.

*Causes of the Stone, Gout, Cholick, Pleu-
rifies, Rheumatisms, Apoplexy, &c.
Assign'd from a different Hypothesis.*

Touching the Causes of those Pains, which are felt to be the acuteſt and moſt exquisite of any by them, that ſuffer the Stone, Gout, Cholick, and ſharp dry Gripes; certain ſharp ſubtil ſeroſities, or rather a vitiated lymph diſcharged from the Brain through the Nerves on the Extremitities, being there lock'd up, cauſe thoſe corroding Gout-Pains, upon thoſe ſenſible nervous parts, though ſometimes ſeroſities, and lymphatic fluors, dripping from other Veſſels, may cauſe great pains, but leſs ſharp, and being more ſubject to be incrassated, may cauſe ſwellings near the Joynts. The ſame ſubtil nervous ſeroſities, or vitiated *Lympha*, being thrown upon the Kidneys, tare and vellicate their moſt ſenſible Membranes to ſuch a degree, that ſcarce any torture can equal it, and that ſometimes, though ſeldom, without the leaſt ſuppreſſion of Urine, but for the moſt part with a total, or partial ſuppreſſion, and a great ſharpneſs of Urine, which is then called a Fir; the pain which at other times the Stone in the Kidneys doth occaſion, being only a heavy obtuſe pain of a long continuance, and more frequent returns, which at great intervals, as *Spring and Fall*, doth invite thoſe cutting ſeroſities to the part, and then alſo are the greateſt Fits; for I cannot conceive that the Stone turning angular, and grating upon the Membranes, is ſo general a cauſe of the Fit of the Stone, as many of the Learned do imagine, ſince a Stone once removed out of its bed or ſeat, where-to its cemented by a glutinous tartarous ſlime, can
easily,

Gout

Stone

easily, if ever return to its place, and be there fastened again as before, for which reason Physicians are very cautious of administering strong Diuretics, for fear of driving the Stone out of its place. Neither do I believe, that those bloody Urines, which are so frequently made by Nephritical Patients, are caused by the corners of the Stone being moved, and wounding or grating of the Veins, but are rather caused by a sharp Serum corroding the mouths of the Vessels, or blood may be squeezed out of the Vessels by the internal swelling of the *Parenchyma* of the Kidneys. It doth oft happen, that some of those forementioned most subtil limpid serosities have taken another channel, through branches of the same Nerve, that tends to the Kidneys, being divaricated and inserted into the great Gut of the Colon, where they cause that great pain, (though less acute than the other, that part being by much less sensible, than the internal membrane of the Kidneys,) which is termed the Stone-Cholick. Since then this acute pain in the great Gut cannot be caused by the Stone, at that distance, its more than probable, that those most exquisite pains in a fit must be occasioned by some other cause, which by many Arguments to me can be no other, than the foresaid Seriosity. *Secondly*, You must consider also, That all Opiates being inwardly taken, perform their Operation by exerting their power upon the Brain, *in principio nervorum*, in withholding the influx of the Animal Spirits, (that communicate sense to the Guts,) and streightning the Nerves, whereby pains are not only appeased in any singular part, but in all parts equally, supposing they were all in pain. *Thirdly*, You are to conceive, that there being a digestion perform'd in the Brain, in converting the Arterial Blood into Animal Spirits, there must be a solution, and afterwards a separation and expulsion of Excrements, which in part are a limpid Serum, that is abandon'd to the Ventricles of the Brain, which are the proper receptacles of that Excrement, as much as the thick Guts are of the Excrement of the Chyle, or the

Opiates

Bladder of the Urine, being the Excrement of the Blood, *Fourthly*, This concession is also required, that this most subtil sharp excrementitious serosity, having quite filled up the ventricles of the Brain in a greater measure, than they can well contain, or throw off through those passages Nature hath ordained, the thinnest part is forced into the *principium nervorum*, (the other part being received into the Veins and *Lympha-duets*) and carried either to the Extremities, or Kidneys, where it causeth the Gout or Stone, or to the Teeth, where it occasioneth a most exquisite Tooth-Ach, or several external parts or joints, producing those violent pains, that are termed a Rheumatism, or to the Pleura, where those shrieking Pleuritic Pains do ensue. Summarily I do believe, there scarce happens any pain, (unless caused from without) Tumor, or Pustul, where this nervous Excrement is not a principal cause, which may be more clearly explained in another place.

Rheumatism.

2. Against this Discourse may be objected, That the Nerves obtaining no visible hollowness, cannot be supposed, to transmit such a quantity of *Limpid Serum*, as must be conceived to cause those before recited Diseases. *Secondly*, That its uncommon, and not natural, for any sort of vessels in the Body, that are destinated to contain, and convey their natural and proper Liquors, Juices, or Humours, to convey any other that is excrementitious, or præternatural. To the first its answered, there must necessarily be proportionable cavities in the Nerves, to contain such great measures of Juices, as have been frequently observed to drib from Nerves, though small ones, that have been cut through in Wounds, and much more from great Nerves, and therefore those larger Nerves near the Brain must be thought capable to contain a very copious quantity of moisture. If the Nerves when cut out of the Body and Dead, do not shew any visible cavities, it is because being empried of their Spirits, and a great part of their moisture, their pores and channels do subside and fall to a close compactness. Besides a Nerve that

is cut out, and grown from a greater bigness to that of an ordinary Pack-thread, when its dried and condensed, is reduced to the smallness of a fine Thread or Fibre, which when it was tumid within the Body, and fully extended, must necessarily have contained a great hollowness, though divided into innumerable very small or minute passages. In answer to the Second, it hath been more than once observed, that purulent matter from Imposthumations in the Lungs, and *Pleura*, hath been evacuated through the Kidneys and Bladder by Urine, whither it hath been circularly conveyed by the Veins, that have taken it up. The thinner part of the Turpentine, that by Glyster hath been injected into the great Guts, hath been taken in by the Vessels, and by circulation carried to the Kidneys and Bladder, as appears by the Urine, giving by its strong smell of Violets a plain evidence of it. True it is, these instances are not natural conveyances, neither is it to be understood so of the Nerves, but to be preternatural.

3! This premised, if you apprehend this *Hypothesis* to be only probable, or apparent, (which I do believe to be Truth, though at the same time I must own, that I do retract from my former Opinions, being thereunto induced by sundry Experiments and Observations) it must necessarily follow, that *Opiates* frequently used, do at length not only withhold, but intirely stop the afflux of the Animal Spirits, and closely shut up the beginning of the Nerves, whereby those acute serosities are pent in, and thrown back into the medullar substance of the Brain, which hapning an Apoplexy, Palsie, Lethargy, or some other Mortal soporous Disease must unavoidably succeed; and hence it is, that in all those, who expire upon their seizure with those Distempers, the anterior Ventricles of the Brain upon Dissection, do ever appear filled with such a sort of acrimonious limpid serosity, the Nerves and other Vessels being either too much filled, or too much closed by subsidence, obstruction, or otherwise, to admit of regurgitation thence.

Opiates

4 Notwithstanding though the daily, weekly, or frequent use of Opiates is most certainly attended with most pernicious consequences, yet the extraordinary and stupendious benefit it imports, even very oft to the recovering a Man from the Jaws of Death, when cautiously and necessarily advised in a fit of intollerable pain, a profuse Hemorrhage, an impetuous Catarrh, violent Vomiting, a fluid *Diarrhea*, long and strenuous Hysterick Fits, when they begin to threaten danger, want of Sleep for many Days and Nights, and such like urgent symptoms, may give a just cause to hold a correspondency with that or the like Medicine, provided it be not too familiar, and be very well prepared, and that in the interval you prevent the necessity of calling this dissembling pacifick Friend in again, by removing the cause of those hazardous Diseases, and that the Patient have Strength, and Spirits enough to wrastle with such a fallacious and dangerous Guest, should he prove too rude. Wherefore I account it the greatest boldness in so many little Quacks and Empericks, even some Widwives, and Nusses also, who being intirely destitute of the necessary skill in preparing this ruffian Juice, and much more of the true knowledge of applying it, dare assume the confidence of administering it so indifferently to the loss of so many Lives, who in my Judgment can scarce have too severe a Law made against them, especially where a Man may be Murder'd privately, without giving the least jealousy, that any thing else besides his Distemper killed him.

CHAP.

C H A P. VII.

*Hypotheses of the Motion of the Heart,
and of Respiration.*

I Have for a long time with an implicate Obedience submitted to the *Dogmata* of the Ancients, confirm'd by the approbation of the Learned succeeding Ages, as appears in former Writings, touching the Animal Spirits and Pulsation, which latter in the Heart and Arteries is by them resolved, to be caused by a pulsifick faculty in both, or as some will have it, originally in the Heart, and from thence derived or continued in the Arteries. This sort of explication now appears to me very negligent, and universally applicable to any thing; for to say, the pulsation is caused by a pulsifick faculty, is equally to saying, that Sight, Hearing, Vomiting, or Purging, is perform'd by an Optick, Auditory, Emetic, or Cathartic faculty; or to be shorter and more general, by a specifick or occult faculty; from which any inquisitive person can receive but little satisfaction, or scarce make a solution of any *Phenomenon*, with the least advantage to the practical part of Physick. Wherefore to make my marks bear the better, in resolving many doubtful Queries, and serving for a true and safer conduct in the practick, I do rather make choice to say, (in imitation of *Copernicus's* affirming the motion of the Earth to the exclusion of that of the Sun or Firmament) that the Heart and the Arteries do not move the Vital or Arterial Blood, but that the Blood moves the Heart and Arteries to a pulsation; in the same manner as may be conceived, that the Air pressing and filling the Lungs, at the same time press the Air, that fills the interstice between them and the Diaphragm, and in a great measure moves the latter to a dilation in the *Inspira-*
tion,

tion, lifting up at the same time the Belly with all the included Bowels, and crowding or condensing the ambient Air, the weight whereof (if I may so call it) or its inclination to be relax again, (in endeavouring to return to its former position,) together with the fuliginous steams, that are forced out of the whole circumference of the Body, in their turn cause the retraction or repercussion of the Belly and Diaphragm, in the *Expiration*; for its a plain and received Doctrine, that the motion of the Diaphragm, which is accounted a great instrument in Respiration, is as much natural, and more natural I may say, than it is spontaneous in Beasts and Infants, or voluntary in Men; and I do farther conceive, if there were no Diaphragm created in Men and Beasts, the ambient Air is sufficient, to set the wheels of the Lungs on going: For there are abundance of moving living Creatures or Animals, that do inspire and expire, on which Nature hath not bestowed a Diaphragm. So that the great use of the Diaphragm seems to me, to be an instrument of expulsion, in causing, or chiefly assisting to exonerate the Guts of its Excrements by Stools, the Stomach of its offensive contents by Vomit, and the Lungs by Coughing. It may be likewise compared to a *Flabellum*, or Fan, that moves and ventilates all the internal Air contained in the great cavities of the Body. The motion of this internal Air, I do conceive, is as much assistant to the motion of the Spirits and Blood in the Arteries, Veins, and Nerves, and to the peristaltic motion of the Stomach, as the Air and Wind is to the motion of the Sea, which latter the greater it is, the higher the Waves are moved. *Secondly*, Natural Philosophy doth Teach us, That as much Air as is inspired and admitted into the Body by the Lungs, so much Air must necessarily be forced out of the Body, to make way for its entrance, which plainly tells us, that the inspiration by the Lungs is the cause of an universal transpiration through the whole Body, and that the same ambient Air being lately squeezed out of the Lungs, must necessarily by expiration return into

into the Body again, through the ambient pores, to make way for that, or else you must allow a vacuum, or void place in the Air, which is impossible; for a place (*locus vocatur, quia continet totum*) is that which containeth and circumscribes something; and how can a place then contain nothing, which is a vacuum? Thirdly, I take the Diaphragm to consist of two Muscles; which appears plain enough in the dissection and narrow inspection of a Bullocks Midriff, whereof one is made use of in the dilation, and the other in the contraction of the Breast; for its absurd to believe, that the same muscle can perform two contrary motions.

That no living Creature can subsist without the Air, and perspiration, is allowed by all, but for what Reason, or what use or benefit the Air doth afford, is only slightly asserted; viz. That it is for ventilation only; that is to say, it gently fans and moves the living Spirits, and therein assists them in separating Fuliginous, and other Heterogeneous little Bodies or Particles, which otherwise would choke, or suffocate the said living Spirits. In the same manner I do conceive, That the Air in ventilating the focal Fire, or any burning flame, doth assist its most subtil particles in separating and expelling fuliginous and other corpuscles, and receives them also in those places, which it (I mean the Air) leaves to fill the places, left by the said fuliginous and other corpuscles; so that a Fire or flame seems to be extinguish'd, or rather suffocated, through want of Air, because it hath no places to deposit its fuliginous and other corpuscles into, and stands in need of its assistance for ventilation and gentle motion.

From this premised Discourse; I deduce these consequences to my self. 1. That upon the goodness of the Air (which consists in a just temperament, a due thinness, and clearness or purity) depends chiefly the Health and long Life of Man. Too much heat, or too great thinness of the Air, moves the Animal Spirits too imperuossly, and consequently

Changing
the Air
conducive
to Health

sequently disperses and consumes them, weakens the Body; and hinders all Digestions; whence it is, that People are short lived, and weakly in the *Indies*, long lived and strong in the *Northern* Climates. Frequently and gently moving, and oft changing the Air from one place to another, though only out of one room into another, seems to me to conduce very much to Health, because by those frequent removes you avoid inspiring the same fuliginous Air, which you do expire; on the other hand, they that live sedentary Lives, that are slothful, or much addicted to lie in Bed, are seldom Healthful, but commonly crazy, and dull in their senses.

If change of Air generally is of so great an Advantage, it is far greater, and consequently of necessity to those, that labour under any Distemper of the Lungs, or any kind of difficulty of breathing; so that I have observed, that many cannot be cured without change of Air, notwithstanding the assistance of the best and most proper Applications, which sometimes the Air alone doth Cure, and other times being assisted with very small Remedies.

That using of violent motion, and continued long, doth at last render the Body Diseased, and is very contrary to Health; for its observed, few of those are long livers.

I am apt to believe, That in the Air are contained most subtil corpuscles, that are homogenous to the Spirits, (though in some kinds of Air more, in some others less,) that nourish or multiply, increase, or are added to the Animal Spirits, whereby the Body is considerably strengthened. Lastly, I do believe, That the Air is the *Primum movens* exertion of all living Creatures; for by inspiration it moves all the Animal Spirits, (as after my manner I have shewed before) which move all the humours and muscles of the Body. Take away the Air, and Life (which consists in motion of the Animal Spirits) ceases at the very moment.

C H A P. VIII.

Of the motion of the Blood, and the cause thereof, also of its quickness or slowness.

1. I Return to the Heart, which to me appears for *The Heart*
 use, like unto a draining Water-Mill, serving *compar'd*
 to throw off, and disperse the water to any parts, *to a Water*
 whither the Wheel shall cast, or direct it by its im- *Mill*
 pulse; in like manner the Heart is an instrument,
 whose principal Office is, to throw the Arterial
 Blood to all parts of the Body; And as the spiritu-
 ous and forcible eruption of Water out of a
 deep cavern of the Earth at the source or spring
 head, together with its being highest in situation,
 (in respect of the declination of those places, to
 and over which its impelled,) is the cause of that
 motion, so the Brain may very probably be esteem'd *The Brain*
 the Source, as being the highest situated; whence *The Animal*
 the Animal Spirits do forcibly rush out into the Cha- *Spirits.*
 nels, Humours and Parts of the Body. Wherefore,
 I suppose the Brain and its Animal Spirits, in re-
 spect of the Microcosm, to be what the Sun and its
 Spirits, or Particles (being its Irradiations or Beams)
 are, that are distributed to all parts of the Terra-
 queous Globe, where motion is perceived, penetrat-
 ing to the deepest bottom of the Waters, and
 through the closest and most compact heap of Earth,
 into its Bowels, where Metals and other subterra-
 neous Bodies are engendered. In like manner do the
 Animal Spirits penetrate from the highest part of
 the Body to the extremest parts, as Toes and Fin-
 gers, which the sense of Feeling doth attest to us;
 and likewise to the deepest parts of the Bowels. I do
 not imagin; that the Animal Spirits being transmitted
 through the Nerves, must arrive to the extremities
 of them, before they can be dispers'd to all the cir-

cumjacent parts; but that the Nerves are pervious throughout all their extent, with lateral Pores, or minute Chanals, through which they burst out in their descent, giving motion to all parts moveable. Neither do I believe there are any Vital or Natural Spirits (as they are commonly term'd) but they are all Animal Spirits (though in a greater Proportion in the Arteries than the Veins,) that occasion the Blood to circulate; for to me it appears improbable, that the motion in the Arterial Blood should cause the Blood in the Veins to move at so great a distance from the Heart, when necessarily their motion must be spent at the Capillars, if the force of motion in the Arteries be by experience found to be less and less, in proportion of its greater distance from the Heart. But that the same motion of the Arteries, should cause the motion of the Animal Spirits, seems to me much more absurd; for the Animal Spirits being incomparatively more subtil, and infinitely stronger and more forcibly (as appears by moving all the joints together with the whole Body) can in no manner be conceived to be moved by Vital Spirits, that are much more gross, and of so little force, that they cannot make the least impulse upon them. If these Maxims be true, that *Entia non sunt multiplicanda præter necessitatem*; And *In omni genere oportet ut sit quiddam primum; Principium numeri est unum, Omnes numeri consistunt ex uno*, (or if I may so say) **DIVERSIS UNIS**. The Brain doth justly challenge the dignity of being the first and sole principal part of the whole Body, having an absolute Empire and Command over all other parts, performing by its Animal Spirits all the Motions, Functions, Actions and Offices of, and in every Bowel, Humor, and all other subservient Parts, which are only Instruments that modify and determine the said Spirits. This whole premis'd Discourse is plainly proved to me by this sole Argument. The whole body of Man is created for the external Senses, and local Motion, and these for the internal, viz. Understand-

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ing, comprehending humane or rational Imagination, common Sense and Memory, which are only three distinct Acts of one sole and chief Faculty of Understanding; of which, the Brain is the Seat, and the Animal Spirits the Instrumental Cause; so consequently all the Parts of the Body must be created, to be subservient to the Brain and its Animal Spirits. Secondly, That the Animal Spirits do move the Arterial Blood, and the Heart, is clearly evinc'd by the Observation of Passions. The Sight, or Hearing, perceiving any dangerous Object, conveys it to the understanding Faculty in the Brain; which, by retracting its Animal Spirits, do at the next instant, cause a slow languid motion upon the Blood and Heart, and sometimes wholly stop it. On the other hand, upon perceiving a pleasing Object, a crowd of Animal Spirits is impell'd into the Blood, which immediately occasions a quicker and more lively motion in the Blood, Heart and Arteries, as may be felt by their pulsation: Whence it appears, 1. That the Seat of Passions is in the Brain, and not the Heart. 2. That the Animal Spirits are perused thro' all the Arterial, and consequently Venal Blood. 3. That nothing in the Body, doth move so swift as the Animal Spirits. 4. That the whole Body is pervious with Pores, and most subtil Chanals, of various Figures and Dimensions. Mercury by externalunction, or fumigation, is let into the Body, through the ambient external Pores, even to the Bowels, and the Brain it self, though applied never so remote. Aloes by friction about the Navil, or any part of the Belly, passeth through the Pores to all the circumvestient Membranes and Muscles, until it arrives to the Guts, where it moves Stools, kills and expels Worms. Tobacco applied to the Wrist, by penetrating through the external Pores to the Vessels, Humours and Spirits, by circulation reaches the Stomach, provoking it afterwards to Vomit, and in some Bodies violently enough. Cantharides externally applied commonly cause sharpness of Urine, and

and sometimes bloody. Opiated Unguents, though applied to the Soles of the Feet, soon reach the Brain. On the other hand, I have oft observed the scent of some Medicines, which I used to give in Venereal Distempers, to pass through the Body to the external Skin, that always prov'd a certain sign the Patient would be cur'd. By all which it appears, that those foremention'd Externals were impell'd through the ambient Pores, by the Air lately expir'd, and crouding into the Body again, at the next inspiration, and that those Antivenereal Medicines, were driven out of the Body to the circumferential parts, by the Air expiring. 5. That the Heart is not a principal part of the Body, but an instrumental and subservient part. 6. That the Animal Spirits are *Toti in toto, & toti in qualibet parte*, performing, as I said before, chiefly and principally, as the sole primar efficient Causes in all the Body, and in every part thereof, all the Offices, Functions and Actions, except the Rational; wherein they are only Instrumentally subservient to the *Anima Rationalis*. I must confess, that this Paragraph is not very Philosophically expressed, neither am I endu'd with Sense enough to defend it from all Objections, and seeming absurdities, and therefore ought rather to be referr'd to Metaphysics, or a *Credendum*. 7. It also follows, that we need give no greater respect to *Cordials*, then to *Hepatics*, *Pulmonics*, *Splenetics*, or to any other appropriated Medicines; but the chiefest and principal Medicine ought to be reputed a *Cephalic*, so that instead of saying *per Excellenciam*, this or that is a *Cordial*, we ought to say it's a *Cephalic*; for all those that are commonly called *Cordials*, are no other than true *Cephalics*, and no otherwise helpful, than by relieving the Animal Spirits, and comforting the Brain and Nerves. Moreover, all the Hypochondriac and Hysteric Syptoms, as Palpitations of the Heart, various Pulsations, sometimes slow, quick, low, or intermittent, Faintnesses, Swoonings, faint Sweats, Convulsions, swimming in the Head, (*Versigo*) choakings in the Throat, stifled, difficult, oppressed, and in-

insensible low Breathings, frequent Sighing, tottering weakness of the Joints, desponding sorrowful thoughts, Urine sometimes as clear and limpid as fair Water, other times white, turbid and muddy, sometimes high coloured, other times pale; Gripings, croaking and thundering Noises about the Bowels and Guts, Vomiting, and sharp continuing Pains at the Stomach, Belchings, Yawnings; Dimness, and recurring darkness of Sight, (*Scotomia*) noise in the Ears, creepings between the Skin, Crying or Laughing, or maddish Passions, besides many more, are all Symptoms of a diseas'd Brain and Nerves, preternaturally affected, discomposed or vitiated Animal Spirits, and are relieved no otherwise, than by Medicines, that relieve and operate upon the Animal Spirits, and immediately by them upon the Brain and Sinews; such are chiefly oleaginous volatil Spirits, and more especially those that consist of a penetrating durable Sulphur; for if they are only Volatil Spirits, (though in that form they are experimented to be very helpful) they exert, lose, and spend their Virtue before they can arrive to the Brain; and therefore its necessary they should be oleaginous and sulphurous, and consequently more lasting. It is also found experimentally, that gentle Narcotics have a great influence, in suddenly suppressing all those recited Syptoms; which being universally owned to operate only upon the Animal Spirits, Brain and Nerves, is a manifest Argument, they are occasioned by an ill affected Brain, and Vitious Animal Spirits. All these prenumerated Symptoms do accompany a preternatural affected Brain, and must be acknowledged to proceed from vitious Animal Spirits, *viz.* Convulsions, tottering weakness of the Joints, sorrowful Thoughts, dimness of Sight, noise in the Ears, &c. excepting Palpitations, intercurrent and various Pulsations, which cannot be thought a Primar, but a Secondary (*per deuteropatiam*) Affection of the Heart, occasion'd through the Vitiousness of the Animal Spirits, stimulating, or other times retarding the Fibres of the Ventricles, and Valves of the

Heart in their motion. How and by what means the Animal Spirits may be vitiated, either by the ill mixture of the constituent parts of the blood, and its impurities, and commixtures with adventitious, or other noxious Particles, will take up more room to explain, than I purpose to allow here in this small Volume, which otherwise may easily be render'd intelligible, or applicable by every Judicious Reader in Physick; and therefore I shall forbear any further Discourse about it. 8. To corroborate my Assertion in the preceding Paragraph, viz. That Cordials ought rather to be called *Cephalics*, may be plainly deduced from the sudden relief, Patients in Swoonings and Faintnesses do receive, from the scents of Spirits of *Sal Armoniac*, of *Hartshorn*, *Cranium humanum*, *Sanguis humanus*, of *Galbanum Assa fetida*, and the like; also from the friction of the Temples, with the thinner spirituous Oyl of Amber, which being admitted into the branches of the Carotid Arteries, are convey'd to all the parts of the Brain, where they rouze up, quicken and stimulate the Animal Spirits, and disintangle them from any adhering offensive Particles; whereby the Patient being suddenly revived out of his Faintness, and Swooning, and the inordinate pulsation of the Heart reduced, is a manifest proof, that these Symptoms commonly are not depending upon any Primæ affection of the Heart, but upon the disturbance of the Animal Spirits. 9. Many have been much puzzl'd in some doubtful Matters relating to Infants in the Womb; as whether in that Station they have Respiration, and whether their Heart and Arteries have Pulsation; and consequently, whether the Blood in the Infant doth circulate, and whether the Animal Spirits exercise the same Functions which they do after it comes out of the Womb. I do conceive, the Infant, as long as it continues in the Womb, doth only live the Life of a Plant, and is like to a Sucker that receives its Growth from the Tree in receiving its Nutriment and Augmentation from the Mother: It hath no Respiration, or as little

Infants
in y Womb

little as can be imagin'd ; and consequently, that its Heart and Arteries do not undergo any Pulsation ; neither doth the Blood circulate in its Vessels, nor do the Animal Spirits perform those Functions they are intended for after the Birth of the Infant. The Parts of the Infant in the Womb lying so compact and close, and every place fill'd up with Humours, Excrements and Internal Air, there is no room left to admit Air from without ; especially being enclosed by two thick Membranes, and a surrounding Moat of Serous Humours : It being the External Air forcing into the Lungs is the chief Cause of Inspiration and Expiration, as I have expressed before, that being excluded, there can be no Respiration in the Infant in the Womb. What I have to say concerning the Manner and Causes of Pulsation, may be best understood by a Comparison to the Sea ; which (though it be in the calmest Season) is subject to heave up and sink down, or to be dilated and contracted, as appears by its Waves, which is not unlike the Pulsation or *Diastole* (Dilatation,) and *Systole* (Contraction) of the Heart and Arteries. The heaving up of the Sea I will only suppose to be caused by an Expansion and Rarefaction occasion'd by the Motion of the Salin Spirits of the Sea, of which it may be thought very pregnant by the strong Smell (being *a parte objecti* the Salin Spirits acting upon or vibrating the Olfactive Organ) of Sea-men's Clothes, and other things. The Air being crouded or condens'd by the swelling of the Waves, forces them down again by the Inclination it hath to recover its former place : In the same manner I do conceive, that the Animal Spirits, that are copiously perfused through the Arterial Blood, do expand, dilate and rarefie it, which causeth the *Diastole* or Dilatation in the Heart and Arteries, whereby the Air that is entred by Inspiration into the Lungs and all other Ambient Parts of the Body, and fills all the Pores that are capable to receive it, is condensed and crouded, but relaxing, beats back the Sides of the Heart and Arteries, which be-
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ing streightned, and having an Inclination to return, do then occasion the *Systole*, or Contraction. The fore-mentiond Comparison differs in this, that the Arteries are moved continually, in Contraction and Dilatation, throughout their whole length, reciprocally, all at once; whereas the Sea is moved into innumerable discontinued Waves, that are lifted up and fall again at opposite and different times; while one Wave rises, the other falls. To which I can only answer, Were the Sea coated about with a thick strong Coat, as the Arteries in proportion are, all the parts of the Sea, or the whole Surface, would be uniformly heaved up at one and the same time, and fall in the same Order, as the Arterial Blood doth in Pulsation.

2. This Hypothesis (how probable soever, or true seemingly, it may be, I will not discuss at this time) implying the Necessity of Admission of External Air to cause Pulsations, explains that the Heart and Arteries of the Infant in the Womb do not pulsate regularly, or orderly; neither do I doubt, but that the Animal Spirits do in some wise move the Blood, (which else by Stagnation, would be subject to Putrefaction,) though not to circulate. And here a Question may be moved, Whether the Blood in its Circulation, or passing out of the extremities of the Arteries, into those of the Veins, is pressed out by the Rarefaction and Expansion of the Arterial Blood by the Animal Spirits in the *Diafole*; whereby taking up more room, and as it were overflowing, it is squeez'd out, or whether it is forced out by the vigour of the Animal Spirits, and the Compression of the Arteries in the *Systole*? But then another Question must follow; How, and by what Force, is the Blood moved in the Veins, where there is no sensible or manifest Pulsation? For to say that 'tis the Force of Pulsation doth move it out of the Extremities of the Arteries, into the Extremities of the Veins, through the fibrous, intercurring, most minute Passages, or Pores, by Pulsation, or rather Protrusion, or thrusting forward, must run us into
great

great Difficulties, if not Absurdities. For, *First*, Considering that the Force of Pulsation or Protrusion must be extremely abated in the aforesaid Extremities of the Arteries, and more in the Intercuring Passages, and yet more in the Extremities of the Veins, which suppose in the Toes, can you rationally imagine, that the Force of Pulsation, that is so very much diminish'd, if not wholly extinguish'd, can be sufficient to force and thrust forward through so great a Length (as reaches so far a distance as the Heart) so great and weighty a Mass of Blood, which it must by Process encounter with in the bigger Veins, besides the Resistance it must meet with in the several Meanders, Turnings and Windings, and a great many Valves (making a great Resistance) of the said Veins, that will still yet more deaden the Force of Protrusion; and yet more, if the Body by streightness of Clothes, or lying upon one Side, suffer a Compression and Narrowness in the Veins and Arteries? *Secondly*, Suppose the left Ventricle when fill'd, to contain two Ounces, more or less, of Blood (according to the Opinion of some Anatomists) in a Heart of a mean Size; and that, according to the same Opinion, by every *Systole* the said two Ounces are with a violent Explosion, as if it were with a Spring thrown into the Arteries, it must follow, that by every Pulsation so much is receiv'd and impell'd into the Veins, which being destitute of a forcible Pulsation to return it to the Heart, cannot possibly in the same length of time discharge it; especially, the Blood being now grown more condensed, incrassated, more fibrous, less spirituous, and possibly from a lower to a higher place, and through all the Valves, which, as I said before, make a very considerable Resistance. If then the Veins cannot receive so much Blood, as is thought to be propelled by two Ounces at a time, by every *Systole*, when probably they cannot receive a Dram or two at most, at every *Systole*, what must become of the remaining Fourteen or Fifteen Drams, that is by every Pulsation thrown out of the Heart?

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Abating so much Arterial Blood as is taken up in the nourishment of the parts, and in the supply of matter for Animal Spirit.

* It must either return, and regurgitate into the Heart; upon which, either an intermittent Pulse must follow, or a total Stagnation, and consequently Death. In short, to make the Veins capable of receiving as much, as by Pulsation is thrown out of the Arteries, you must grant as rapid a Motion, or flowing in the Veins, as there is in the Arteries, which all that have the least Sense must deny; for the Blood in an *Arteriotomia* doth spurt out of the Arteries with ten times the force, and in ten times the quantity, in the same proportion of time, and consequently is moved ten times swifter. It must then follow, that in every *Diastole* the Ventricles of the Heart are either not quite filled, or not entirely emptied in every *Systole*, which I do verily believe is so. By what is here discoursed, it appears, that very oft the cause of an intermittent Pulse is the incapacity of the Veins, by being obstructed in some place or other, to receive the proportion of what is thrown into them by the Arteries; and the cause of an universal Stagnation may be thought too great a Repletion in the Veins, wholly excluding the Reception of any Blood from the Arteries.

3. Should it be allow'd, that the Heart by every *Systole* throws two Ounces of Blood (which some do assert the left Ventricle to be capable of containing) into the Veins, and that they receive it; then it will follow, that reckoning only 500 Pulsations in a quarter of an Hour, there must be circulated fifty Quarts; and consequently, that the whole Mass of Blood, or all the Blood that is in a moderate Man's Body (which is thought to contain from Eight Quarts to Twelve, according to the greater or lesser quantity of the fullest, or thinnest of Men, being in Health) must be circulated or moved round from the Heart, through the Arteries into the Veins, and thence into the Heart again in three or four Minutes, and about a Pint every eighth part of a Minute, which

which must require a Motion more rapid, and make a greater noise, than the *Thames* under *London-Bridge*. Such a career in the Blood must be supposed to make more way in fewer Weeks, than the Sea and Wind together do, in carrying a Ship to the *East-Indies* in many Months. Besides, such a violent Motion would not only burst the Veins, and break the Fibres of the Blood, but chern it into red Butter, and blue Butter-Milk. Moreover, Motion causing Heat, such a Violence would immediately put the coldest *Iceland* into a burning Fever. It is observ'd, that the too violent and quick Motion in a continual Fever, makes a separation in the Blood of the Oily sulphurous parts, swimming on the serous, not unlike Milk, which the violent and quick motion of the Chern separates into Butter, and a thin serous curdy Milk.

4. That the Ventricles of the Heart are not fill'd by every *Diastole*, nor quite emptied by every *Systole*, appears plainly in *Hypochondriacs*, and *Hysterics*, who sometimes having a large, high, and quick *Diastole*, (as may be felt by feeling the Pulse of the Wrist) and a low, streight, and slow *Systole*, shews that the taking in must be more than the going out. Soon after the *Diastole* is chang'd from large to low, small and slow, and the *Systole* quick, which signifies a lesser Repletion of the Ventricles, and consequently, that they were not fill'd as before. What can you think of a Vermicular Pulse? Here you must allow, that the Ventricles are far from being fill'd in the *Diastole*, or emptied in the *Systole*. I do foresee, that it may be reply'd, that notwithstanding the Pulses do vary from large and full, to narrow and small, the Ventricles may be filled, because, in those narrow, low Pulses, the sides of the Ventricles do fall, and then consequently may be fill'd accordingly: That is to say, the Fibres of the Heart are relaxed, and so the Ventricles must fall into a narrower compass, like unto a Bag that's empty, for want of something to fill it; but then, still its a Sign they have a capacity of being fill'd, which they are not by every *Diastole*, as I have shew'd before.

5. From

5. From this premis'd discourse it must necessarily follow, that the influx of the Blood into the Ventricles, is the cause of filling them more or less, according to the proportion of the Blood flowing in, and consequently to that, that it's the Blood moves the Heart by Rarefaction and Stimulation, according to the proportion of Quantity, and Quality of the Animal Spirits it's repleted with. If the Blood be thick and gross, for want of Animal Spirits to rarify and move it, the *Diastole* must necessarily be slow and low, because the Blood through its thickness, cannot enter in any great quantity, nor stimulate; if it be thin, much rarified, and full of good Animal Spirits, the *Diastole* must be large and high, and if very stimulating, quick. So that the Variation of Tunes of all the Pulses must be caused, in my Opinion, by the quantity and quality of the Animal Spirits, and the Blood; and the causes of Stagnation, intermission of Pulses, and several other Affections of Pulses, of Apoplexies, and abundance of other Difficulties cannot so readily be Assigned, and Reasons given thereof, but by supposing only (though it were really otherwise) that the influx of the Blood is the moving cause of Pulsation, and not the Heart; which notwithstanding all Objections, whereof in the next Paragraph I shall recite the chief of them I do believe to be true.

Muscles

6. That a Muscle is the cause of Motion, its vulgar Definition, or rather Description doth imply, viz! *A Muscle is an Instrument of voluntary Motion*, which seems to overthrow, what is by me asserted for a Supposition, on which the preceding Discourse of the cause of Pulsation doth depend; and consequently that the Heart being a Muscle, must be the cause of the motion of the Blood, to which I do answer, That the Heart cannot properly be term'd a Muscle, because its Motion is not Voluntary, as must be own'd by all, but Natural; and if so, must be moved by an Extrinsic (in relation to the Heart) moving Cause, which can be no other than the Blood and the Animal Spirits, wherewith it's repleted; for

Quic-

Quicquid movetur, movetur ab alio. True it is, the Fabrick of the Heart is very like to a Muscle, I should rather say to a two-fold Muscle, whose Fibres consisting of two different Orders, Positions, Figures, and Disseminations, do both meet in the Cone, exactly resembling a two-fold Tendon, though far from being a real Tendon, either in the Texture, Toughness, or in its Office, which is to be subject to local Motion at the Pleasure of the Will; whereas the Motion of the Heart is purely Natural, and caused by the Blood and the Animal Spirits rarifying it. Besides, there is a great difference in the Figures, which are streight, and terminate where they are inserted; whereas the nervous Fibres that meet about the Cone of the Heart, are not streight, but posited Oval, that is coming down, and returning again upwards in an Oval Figure; so that one Muscle (that is to say nervous Fibres disposed in Muscular Positions) seems form'd for Dilation, or opening, to admit the Blood; and the other for Contraction, or shutting out, or discharging of the Blood, both these Analogous Muscles receiving their Animal Spirits from a Branch of the Sixth Pair.

7. Touching the motion of the Blood in the Veins, which to me appears, cannot be caused by Pulsion of the Arterial Blood, as being moved incomparatively slower, by reason of its consisting of thicker and grosser parts, and fewer Animal Spirits, and being much hinder'd by the Valves, breaking the force of its motion: which said motion I do suppose, is caused by rarefaction of the Blood, through the continual and forcible agitation of the Animal Spirits, by which means it's squeezed or pressed forward; and furthermore, I am apt to think, that there is a kind of pulsation in the Veins, but so weak and low, that it's scarce perceptible. It is likewise my Opinion, that the local motion of all the Humours, whether natural, or preter-natural, or excrementitious, is caused by rarefaction. Before I leave this Subject, I think my self oblig'd to let you know, I am not so forgetful, as not to remember,
that

that in some former Writings, I have set down some Opinions much different, and others contrary to these I have now declar'd, being misled by commonly receiv'd Sentiments of the Learned, and now (as I do believe, for I shall scarce be ever positive in any thing) better inform'd by many Experiments.

CH A P. IX.

Of Celebrated Remedies against Consumptions.

1. **F**OR the present I have detain'd the Reader long enough in Theoreticks, I will now make bold to offer some Observations on the Practick, the Vanity whereof in many particulars, appears to me very extravagant: And in regard I would avoid being troublesome, I shall only make choice of those Diseases that are most universal, and begin with Consumptions, I mean those that are occasion'd by an Hectick Fever, and attended with a chronical putrid Cough; namely, such as is caus'd by a putrid slime, and sometimes accompanied with an Ulcer in the Lungs, known by purulent expectorations. I will not undertake here to enter into a discourse of the Causes, and Indications, that are to be drawn thence, but only recite such Remedies, to which many do attribute great Virtues, and make appear, how vain, fruitless and deceitful they are. By the way let me tell you, there are many consumptions, that may properly be so call'd, that are neither occasioned nor accompanied with an Ulcer in the Lungs, but sometimes in the *Bronchia*, other-times in the *Aspera Arteria*, and sometimes with no Ulcer at all, but very oft with an ulcerous putrid slime only. Passing by the gentle Purgatives, as *Cassia*, *Rhubarb*, &c. that may be necessary in the Beginning, and sometimes in the Progress; I shall only

Purgatives

only examine the Remedies that are so highly recommended against Ulcers in the Lungs, and ulcerous Coughs of Consumptions.

2. *Syrup of Turnips* is a very celebrated Remedy *Syrup of Turnips* here in *England*, and no where else; which after it had been used by many in proportionable quantities, at seasonable times for three Months successively, they have notwithstanding all its Praises, gone off, without the least abatement of their Coughs, or improvement in their habit of Body. Neither can I any ways discover, whence those pretended Vertues should proceed, or in what part of the Turnip its wonderful strength doth lye. It's apparent enough, that the expressed boyl'd Juice is waterish and windy, not nourishing, nor abstersive, neither hath it such a cooling quality, as to have the least prevalence in abating the Hectic Fever; so that I do look upon it to be a foolish vain Medicine. True it is, that the Sugar in it may seem to allay the salin slime, smooth, and lenify the Gullet, which upon this occasion is ever very rough, and so in some measure seem to ease that part for a little time; but after it hath been some little time in the Stomach, turns into a very sour, piercing, and almost corroding moisture, which allowing after some considerable time it doth arrive to the Lungs and Wind-pipe, must under those qualifications render the said Parts more rough, and rather provoke, than in the least abate the Cough.

3. But *Ground Ivy*, alias *Alc-hoof*, alias under several other Names, is the *Catholicon* of the Vulgar, and of many Physicians also, who appropriate it to the Eyes, Kidnies, Bladder, Lungs, and to the cure of internal and external Ulcers, proclaiming it the chief of all Vulneraries. These singular Commendations do encourage many to use it in all their ordinary Drink; some for to cure and preserve their Eyesight, others against the Stone, Gravel, Hypochondriac Vapours; and in Consumptions supposed to be caused by an Ulcer in the Lungs, it is entertain'd for a None-such. *Quercetan* the *Armenian* gives you his Word, that with the Juice of it boyl'd into a Syrup

Alc-hoof

with Sugar of Roses and penid Sugar, mix'd with Flowers of Brimstone into a *Loboch*, he hath recovered many desperate Consumptives, who either in my opinion, were not in a proper Consumption; or Chymist like, boasted of what he never observ'd. All those eminent qualities of this Ground-Ivy, are supposed to flow from a diuretic and absterive Virtue, as most Traumaticks are thought to do their feats by. But where this subtil Spirit, of bitter Salt is to be found, I am yet to seek. I have sundry times advis'd it to Consumptives, to be used sometimes singly in a Syrup, other times join'd to *Bugle*, *Speedwel*, *Sanicle*, *St. Johnswort Flowers*, *China-root*, (and sometimes *Sarsaparilla*) *Dates* and *Liquorish* boil'd to a good strong Decoction, to be sweetn'd with Sugar of Roses, and taken at *Horis Medicis*; besides, a smaller Decoction made with the addition of a few fresh Ingredients, to be drunk at other times. Thus though used ten or twelve Weeks successively, with a good Barly Broath and Milk Porrage Diet, I have observ'd to be as ineffectual, and unsuccessful, as all of the other celebrated Remedies I shall hereafter mention. True it is, that many youthful, or otherwise strong Bodies, that have been molested with a long strenuous Cough, copious and foul Expectations, to as a sensible wasting of the Flesh and other parts hath ensu'd, have been restored to Health, upon Pectoral Syrups, and Decoctions made after the forementioned Model, whence to those Remedies the Titles of *Infallible* and *Sovereign* have been attributed, whereas the Disease was not accompanied with an Ulcer in the Lungs, or an Hectic Fever, but remov'd by sparseness of Diet, and possibly change of Air, so that not the least advantages have been derived from these Pectorals, but rather a detriment, if you will with me believe, that all Sugars and sugared Medicines turn sour in the Stomach, and assume a sharp fretting, and sometimes corroding quality. Is it not a daily Observation, that many Persons of the best Quality labouring under a Consumption, whose Fortunes do enable them to be assisted

Sugared
Medicines
turn sour
in y^e Stomach

assisted by a Chorus of Physicians, performing their utmost endeavours, by prescribing all the noted Peccorals, maugre all their uselesse Efforts, are forced to yield to the fury of their Distempers? However, take notice, that I do not offer this sort of discourse, to discourage any Consumptive from applying to a Physician; for considering, one so Diseased is under a Sentence of Death, and to continue so, is to dye every Day, every Week, and every Month, which is more terrible than a Pestilential Fever, whereof a Man dieth but once; the advising with a Physician who shall give you hopes every Day, Week, and Month, of recovering of you, will wholly abate your Terror, untill the very Moment you leave him, and he leaves you.

4. *St. Johnswort* in its Flowers, under the Notion that it's one of the chiefest Traumatiks, having by infusion in Water, Mead, or small Ale, and a little boiling towards the latter each, impregnated either of these Liquors with its Virtues, and with Sugar, or rather Honey reduc'd into a Syrup, is by many approv'd very soveraign to Consumptives; the Truth whereof can be best attested by several, that have used it several Weeks to no purpose.

5. Among all the decanted Remedies against Consumptions, I find Physicians have a great respect for *Sugar of Roses*, and for being a kin to that, for *Conserve of Roses*; of which former, it is the Report of *Avicen*, that a certain Woman, who was in a desperate Consumption, was not only recovered by it, but made fat thereby; add hereunto a concurring Testimony of *Mesues*, that many have been cured by it of Consumptions, that being no less recommended to them than the latter, viz. *Conserve of Roses* by *Montanus*, *Valleriola*, and *Forestus*, who pretend abundance to have been cured by using vast quantities of it; and *Riverius* tells you likewise, that he knew an Apothecary, that was cur'd of a Consumption, only by almost continually eating *Sugar of Roses*. On the other hand I am well assur'd, that most practising Physicians, if they are pleas'd to

peak the Truth, can tell you, they have known hundreds of Consumptives that have used it in gross quantities, without the least benefit: As for my own particular, I am so far from believing, that any Consumptive, to whom at any time I have advis'd it, upon the credit of the forementioned Authors, have receiv'd any advantage, that they rather were render'd much worse by it: And my Opinion further is, scarce any thing is more unwholsom than Sugar, whose greatest use is to please the Palates of Women and Children, and to preserve Fruits and Herbs from corrupting. It cannot be denied, but that eating much Sugar destroys the Appetite, by raising Fermentations and Ebullitions, which extremely annoy Digestion; sometimes causes Loosenesses, Fevers, ill habits of Body, &c. and is no ways Pectoral.

Sugar
unwholsom

Liquorish
good in
Coughs

Sugar of
Roses -

Of all Sweets, nothing is more Pectoral than English Liquorish, and its Juice; and if it be true, that most Countries afford a native Remedy for Endemick Diseases, they are subject to breed, Liquorish may very well be accounted as such in Coughs, and those Diseases of the Breast.

We are then to consider the Conserve, and Sugar of Roses, to be intended only as a preserver to the Flowers, and their Juice; and therefore the principal Virtue must reside in the Juice, and how far that is Pectoral, or absterfive to the Ulcers in the Lungs, I cannot well apprehend, especially if it be said to be drying, binding, stopping, restraining, and consolidating, which most certainly are Qualifications contrary to smoothing, or absterging; for what is binding and rough, must cement, thicken, detain, bind and fasten the putrid matter in the Lungs, and entirely hinder and stop up the Expectoration, either of purulent matter, or putrid slime. So that I cannot conceive those Authors recommended these Rosie Remedies against Ulcerous Consumptions, but only against such as they supposed to be occasioned by a Catarrh from the Brain of thin salin Rheum upon the Lungs, which the drying and con-

Catarrh

strictive

strictive quality of the *Roses* might thicken, and by straightning the Passages, put a stop to the Catarrh. That humours falling upon the Lungs do cause a Cough, cannot be apprehended; for being without sense, and having no Nerves disseminated through them, are not capable of being stimulated into a Cough; so that what ever is conceiv'd to occasion a Cough, must be something annoying and stimulating of the *Bronchia*, or Lung-pipes. Neither is it probable there can be any Catarrh fall from the Brain, that being shut up as close as a Box by its Membranes, and Bones of the *Cranium*. Wherefore *Rheums* those *Rheums* can only be thought to drip out of the Glandules of the Throat, and *Aspera Arteria*, upon which those astringent Medicines do seem to have an Influence. *drip out of the Glandules of the Throat*

9. Certain it is, that such saline Rheumatick Constitutions are very subject to be extremely emaciated, against which it's no wonder, if a Diet of *Alles*, or other Wheyish Milk, together with their *Hordeata*, and *Amygdalata*, Snail Waters, Decoction of Snails, Lobsters; and yellow Saunders, proved such Auxiliary Remedies; though I can never believe these *Hordeata*, *Amygdalata*, Waters, or Decoctions of Earth-Worms, Snails, Claws of Lobsters; (whereby, as *Cardan* doth write, he hath cured many desperate Consumptions, to whom being more an Italian Romantick Astrologer, than a Physician, little credit can be given.) Syrup of Comfry, of Milfoil, Bugle, and the like, they being all thickeners, ever cured the least Ulcer in the Lungs. *Learned Uses Milk.*

10. Much less can I believe, that ever *Erastus*, *Fracastrorius*, and other Italian subtle Fourbs ever cur'd so many Consumptives (as they pretend more out of a decoy to allure Patients, than a real Truth) with a Decoction of *Guaiacum*, who probably were macerated by a Pocky Consumption, which is so Epidemick among them, and no less endemick, being the place of its Nativity. *Quack Medicines*

11. Some are so void of Sense, to approve of Spirit of Sulphur, or Vitriol, given in four or five

drops, in a small Glass full of Plantain, or Rose-water.

Narcotick
Stupifying
Medicine

12. The Narcotick Thickning, and Emplastick Powder of *Hali Abbas*, consisting of the Seeds of white Poppy, Cucumber, Melon, Citrus, Quince, Gourd, Porcelane, and Mallows, Gum-arabick, Tragant, Starch, burnt Ivory, Juice of Liquorish, Renid Sugar, is a meer heap of Rubbish, by which *Velastus de Taranta*, and *Forestus* do each affirm, to have cured a single Patient of a proper Consumption; but ought not to be credited, that probably being only an Emaciation from such a Catarrh of a saline Rheum, as is before mentioned; notwithstanding this Powder is still in great esteem among many Physicians, who never yet observ'd their Patients receiv'd any great benefit by it.

Elixer
Proprietary

13. An *Elixir Proprietary* tartarised, and so prepared, as to be very little bitter, and not laxative, used in a Decoction of Mallows, or Marsh-Mallows in Whey, Mead, or very small Ale, is a Medicine far more commendable than any yet proposed. But the most proper Remedy I could hitherto yet discover, is a subtle penetrating Balsamic Tincture, taken in a true Pectoral Decoction for a Month, or six Weeks.

After Milk
v.p. 61.

14. As for *Asses Milk*, it is rather a Medicinal Diet, than a proper Remedy; and, as I said before, by diluting and nourishing is helpful to saline emaciated Bodies, and to Ulcerous Consumptives also, though if it ever singly cured one such, it hath fail'd a thousand times in others.

Sulphur

15. *Sulphur*, though indued with an extraordinary Virtue against all internal and external Ulcers, is not to be understood as such, being exhibited in Substance, whether in Flowers, or otherwise, but ought to be dissolved and open'd by a proper *Menstruum*.

16. Before I conclude this Chapter, I can scarce pass by an Observation upon some deceitful Empiricks, who after Patients have labour'd a long time under a proper Consumption, and a tedious fruitless cure of Physicians, have found a way to let themselves in by a specious

a specious Promise, accompanied with a large Declaration of bombast Words, that they shall be cur'd in six or eight Days, by only administering some common Pectoral Julep, or Apozem, proportionably enforc'd with *Diacodium*, or *Laudanum Liquidum*, by which, on a sudden procuring rest, abating the Cough by suppressing Expectoration, and through those Narcoticks putting a stop to the violent motion of the Animal Spirits, (into which they are irritated by the pungent Pulent, or putrid slimy Matter adhering to the *Bronchia*, or sides of the *Aspera Arteria*; for according to what I have observed before, the Animal Spirits are the sole causes of all motion in the Humors) the Patient hath seemingly been wonderfully recover'd, and felt himself at a great deal of ease, though in effect, this way of proceeding did considerably hasten his Death, (by locking up the Matter) which though hapning so suddenly, the Empirick notwithstanding, finds a way to get great Reputation by it, only by telling the Standers by, that they may plainly observe by the great Benefit the Patient received in so little time before his Death, that had he been callen sooner, in all probability, as they may judge themselves, he might have cured him. Among the rest of those Quacks, I knew one, that by many was called the *Consumption Doctor*, who did confess to me, that his usual Medicine was what follows: He took of *Pennyroyal-water*, and *Scabious-water*, of each half a pint, therein he dissolved of *Oxymel Simplex* (and sometimes *Oxymel scilliticum*) four Ounces, and as much of *Diacodium*, which made a thick Julep, or a thin Syrup; hereof he would cause the Patient to take four or five Spoonfuls three or four times in a day. This was the same Person, and the same Medicine, by which he pretended to have cured one Captain O Brian of a Consumption, which at that time made a great noise, and was taken notice of by His Majesty King Charles, as the Treatize, which was written upon it, mentions; though at the same time, you are not to conceive this Patient to be otherwise troubled, then with

p. 43.

a long Chronical Cough, occasioned by Debauches, being without an Hætic Fever, nor having his Lungs toucht in any sort, of which, and his Leanness, he was rather recovered by the continuance of a Milk-Diet, and his detainure from Brandy, and other strong Liquors, which had caused this Distemper, though the giving seasonable Rest to his Animal Spirits by the said Narcotic did also in some measure contribute to it.

Change
of Air.
The best
& worst
Air.

17. Air being the life of the Lungs, a Consumption cannot be hoped to be protracted, or palliated, much less cured, without exchanging from a worse to a better, which is most agreeable in a dry, gravelly, stony, or sandy Soil; not low, because subject to Damps, not high and mountainous, because exposed to sharp Winds, that are more offensive to the Lungs than Damps, Vapours, or Fogs; neither can the Air of any place situate Westward of any great River, Bog, Marsh, Pond, or Moat, be healthful, because the Damps, Vapors, or Fogs, that are raised by a Setting Sun, continue all night, and are not dissipated before the Sun-rising the next day.

A Consumptive
Cough
in y^e begin-
ning.

No Distemper is easier cured than a Consumptive Cough in the beginning, I mean of a Fornights, three Weeks, or (sometimes) a Months continuance, that is before the whole Mass is perfused with a putrid Slime, or the Bowels tainted with it. I dare be positive, I have cured hundreds in my time without the use of those common Pectorals, as Syrups, Lohochs, Lozenges, &c. which, as they annoy the Stomach in taking away the Appetite, hindering Digestion, and contributing towards the putrefying of the Slime in the Stomach, and the chyle that is daily ingendred.

18. I am fully convinced, that Consumptions in youthful Bodies, strong before their Illness, not being very much depraved in their Bowels by a foul ill habit of Blood, and other Juices (Cacochymia) are curable, if undertaken six Weeks, or two Months at least, before their expected end, and opposed by proper Remedies given frequently, and in large

large Doses; for I have oft observed, that many Medicines have failed in their expected Effects, by being under-dosed.

19. As for Issues made in the Neck, or Arms, they can bring no Relief, in respect of cleansing the Ulcer in the Lungs, or correcting of the putrid Slime, neither can External Fumigations signifie much. *Jones - no Relief*

CHAP. X.

Of continual putrid, and malignant Fevers.

1. **L**onger Experience hath induced me to recede from my former Opinions in continual putrid, and malignant, I may say, in all sorts of Fevers, where the Blood tending to a dissolution of the Mixture (I ought not to say subversion of the *Crafsis*, or Temperament, being less intelligible) of its Constituent parts, namely of its most subtle parts, which are the Animal Spirits from the less subtle, and grosser, or of its sulphurous from the Mercurial. and saline parts, may properly be termed Putrefaction, which is not necessary, or constantly observed, to be attended with a Stink, as appears in a Gangrene of any part of the Body, that is seldom or never accompanied with a Stink; though a Corruption, *Sphacelus*, or Mortification always is. By this Separation the most subtle parts, or Animal Spirits running together, and being accumulated in greater heaps, do move much more impetuously, whereby the said mixture is more and more dissolved every minute. By this Acceleration of Motion the natural Heat (whereof Local Motion is the sole cause, as appears by Attrition, or rubbing any thing for a time together causes a Heat; or by the quick and violent motion of Spirits of Vitriol, being affused upon Steel, raising a great heat) is augmented into a greater and preternatural Heat, so that the preternatural

natural Heat following the dissolution of the Mixture, cannot be thought to be the cause, (which must precede the Effect) but a consequent Symptom, and Effect of a putrid Fever, whose Essence therefore cannot be said to consist in a preternatural Heat, or can it so be defined. Moreover, there are some Fevers, wherein no preternatural Heat, quick Pulse, or high-colour'd Urin is perceived, as appears in many malignant Fevers, where the mixture of the Blood is dissolved by a sudden extinguishing, or mortifying the Animal Spirits by venomous Particles commonly admitted from without, or sometimes bred within the Body, which confirms, that a Fever is not a preternatural Heat first kindled in the Heart, whereas it's oft kindled in other parts: As for Instance, when an Inflammation of any Bowel, as Lungs, Liver, &c. or where any great Pain is raised, there the Heat is first kindled, and thence communicated to the Heart, and all the parts of the Body. That there is such a dissolution in the Blood, is evident by the Blood, that is drawn off by bleeding in putrid Fevers; the parts being plainly separated one from the other. So that advising all the

Coldest Things
don't Lave
in Fevers Coolers you can imagine, be it Snow-water, Frog Spawn-water, the coldest Spring-water, Whey, sour Butter-Milk, or Juleps made of Succory, Endive, Water-lilly, or any other Waters, though infused with Spirit of Vitriol, Sulphur, Nitre, or Salt, and a Solution of *Sal prunelle*, they avail so little in Fevers that they are generally found to increase them in all the Symptoms, as the preternatural Heat, high and quick Pulse, deep-colour'd Urin, and the rest are sensibly raised to a much higher pitch. Neither doth Bleeding in the least contribute to the abatement of a Fever by cooling *per se*, but by some other way *per accidens*, as I shall endeavour to explain hereafter. That Physicians have most of 'em, if not all, wholly abandoned prescribing such sort of cooling Juleps, as being rather detrimental, and content themselves with advising small clear Possier, thin Gruel, &c. is an Argument. that putrid Fevers

Fevers are not preternatural Heats, nor are they not primarily caus'd by them.

2. That the Circulation of the Blood in putrid Fevers is too quick, and the Blood too much rarefied, by the too quick motion of the Animal Spirits, is very apparent, and therefore lessening the Blood by bleeding, must also lessen the Circular Motion, and diminish the Animal Spirits; which being reduced to a moderate Measure, as may be done by one bleeding or two, is as much as can be expected from that Remedy; the Spirits being thereby render'd more free, and the Vessels more Capacious, are put into a State of performing their Office with more ease, in throwing off Heterogeneous, and very offensive Particles, that are got into the Blood, either from without, or bred in the Body. But should you proceed to a Third, Fourth, Fifth, Sixth, and Seventh Bleeding, you will draw off so many Animal Spirits, that the remainder must be insufficient to perform their aforesaid Office, wherein the cure of a Fever doth consist; and should you tap off all, or most part of the Blood in the Body, as I fear too many do, and have done out of Ignorance or Stubbornness, the Fever would, and must still continue proportionably in the same Vigour and Degree; so that this way of proceeding must sooner kill the Patient than the Fever. As for Malignant Fevers, the most Sanguinary Physician will scarce Adventure beyond a single bleeding, which the more judicious think to be one too many.

Bleeding
once or
twice but
not more

in Malignant Fevers

Purgative
vomits

Blisters

3. Glysters, gentle Purgatives, and Laxatives, also mild Vomits, used sometimes in the beginning are not look'd upon as Remedies *per se*, and directly opposite to Fevers, but only helping *per accidens*, in removing excrementitious Humours, that otherwise might annoy the Spirits, and deteriorate the Fevers: Neither can Epilpastick or Blistering Plaisters be thought to be otherwise advantageous, than by stimulating the Animal Spirits, (upon which, as I intimated formerly, they seem to Operate peculiarly) to throw off those heterogeneous and febrile Particles;

Particles; for I cannot conceive any are so wanting of Judgment, as to think, that the cause of the putrid, or malignant Fever is in the Serum, whereof part is contain'd in those Bladders or Blisters, the *Cantharides* have occasioned.

The main
thing in
curing
Fever.

4. It remains then, that the whole Stress in curing continual, putrid, and malignant Fevers, is by most of our modern Physicians, laid upon such Compounds, as are call'd Cordial and Alexipharmaceutical Waters, Powders, and Electuaries, also some Chymical Preparations, as *Antimonium Diaphoreticum*, *Bezoarticum Minerale*, *Spiritus cornu cervi*, *Spiritus fuliginis*, &c.

Alexipharmaceutical
milk.

5. The chief of those Cordial Alexipharmaceutical Waters now most in use are *Aqua Theriacalis*, *Aqua Protheriacalis*, (perhaps the better of the two, as consisting of fewer Ingredients) *Aqua Epidemica*, &c. The Electuaries are *Theriaca Andromachi* (which is accounted more temperate than *Mithridate*.) *Theriaca Londinensis*, and *Diascordium*. The compound Alexipharmaceutical Pouders are usually compiled out of some testaceous Pouders, as *pulvis a chelis cancrorum compositus*, and others of Crabs Eyes and Claws, Pearl, Oriental Bezoar, burnt Harts-horn, and sometimes mixt with *Radix Carlina*, *Contrajerva*, *Serpentaria Virginiana* (which are the chief) *Dictamnus Creticum*, *Angelica*, &c. By these, and the like, as the *Goat Stone*, *pulvis Pannonicus ruber*, it's supposed the Heart is much strengthened, and the Animal Spirits encreased, and provoked to throw out the *materia febrilis* by Sweat, and the vitiated sour ferment, as they call it, corrected and abated by being imbibed by the said testaceous Pouders, which vitious Acid being daily mixt with all their Edibles and Potables, and thence transmitted into the Vessels, and mixt with the Humors, would otherwise continue, and augment the Fever, being by some supposed to be the chief cause of many sorts of continual putrid; and sometimes malignant Fevers; so that they do esteem *Diaphoretics*, and testaceous imbibers (which neither do they give in proportions by five parts in six, large enough,

The water
don't take
provokes
Sweat.

or frequent enough, to expect any great Advantage from) to be the only true and adequate Remedies, against all continual Fevers, as the Physicians of the Southern parts do only acknowledge Bleedings.

5. We are to observe, that the Animal Spirits are continually employed, from the beginning of a continual Fever, to a declination, in subduing the *Materia febrilis*, which is commonly termed a Digestion, or Concoction; at the Declination they apply themselves to the Separation, and Expulsion of the said febril Matter, which in colder Climates is more frequently by Sweat and Urin, and sometimes by Stool, Hæmorrhage, Impostumations, or some few otherways.

6. If then the chief scope is to throw off and expel the febril Matter by Sweat, three things ought to be considered. 1. Whether Diaphoretics ought to be used before the Declination of a Fever, at which time only they appear to be helpful in assisting Nature to throw off; for it must be own'd by all experienced Practicers, that the *causa febrilis*, be it vitious Humours, heterogeneous Particles, or what other offensive Matter they are please to allow, must be first subdued, or digested, and separated, before it can be expelled by Sweat; and therefore should you exhibite the largest Doses of Diaphoretics, that Nature can possibly bear, and second them by loading the Patient with a number of Bed-cloaths, he will scarcely be brought to sweating; and if peradventure he should happen to be forced into a Sweat in the beginning, augment, or state of the Fever, it must be to a very great Detriment, by diverting the Spirits from their necessary task, and squeezing the *serum* from the Humours, whereby they are thickned and hardned, which ought rather to be diluted at those Seasons. Moreover, by putting so great a force upon the Spirits, they must necessarily be much divided, dissipated, and inflamed. Secondly, whether Sudorificks given in moderate Doses, so as to be insufficient to provoke Sweat, do not assist the Spirits by increasing them, (I mean, such as contain

Sweating not to be used till y Declination of a Fever
Boerhaave
n. B.
some

some vinous Spirits, as Epidemic, as Treacle-water) putting them into a gentle Agitation, whereby the febril Matter may be subdued, or digested. *Vox Medicorum* both proclaim they do, and therefore they are prescribed by them from the beginning to the ending of Fevers, in no greater measures, than what Nature seems to require. For my own particular, I can scarce believe, that those Spirits are, or can be render'd Homogeneous to the Animal Spirits (whatever they are when a Man is in Health) being now under a great Disorder, and Disturbance; and as for the other subtle Particles, that are supposed to be in the Ingredients of the said Alexipharmaceutical-waters; how far they are conducing in subduing the febril Matter, can best be prov'd by the Success, ten dying under the use of them, to one that Recovers, whose Recovery may rather be attributed to the strength of Nature, a due Regimen in his Diet, and doing him no hurt by improper Remedies. Thirdly, Supposing fictitiously, that Diaphoretics were proper, the uncertainty of their Operation would often occasion a failure of the Effect that is expected from them. *Purgatives* and *Vomitorics* seldom or never fail in their Operations, if justly Dosed: But *Sudorifics* and *Diuretics* very oft, though administr'd in great quantities. Many Quarters of Plague-water have been drunk for Pleasure at one time, by several that are in Health, without the least Sweat following upon it: And as many Diuretic Juleps have been swallowed by Nephritics, who have not made a drop of Urin the more after them.

Purgatives
&
Vomits.

Taking
Cold

True it is, that many upon receiving of crude saline Particles from without, I mean the External Air into their Bodies, (which is commonly termed, taking of Cold, for want of sufficient Cloathing, to keep the said Particles out) have fallen into a Fever; namely, *a *Diary*, or *Ephemera*, and sometimes a *Febris continua Imputris*, or a continent Fever; upon taking immediately in a *Diary*, some potent Diaphoretic, with the Assistance of a Load of Bed-cloathes they have soon fallen into a Sweat,

*. a *Diary* or *Ephemera*. A continual Fever which lasts but one Day.

Which concluded hath wholly carried off the Fever, by expelling the said saline Particles, that did violently agitate the Animal Spirits. Now from hence it is, that many do believe, as Sweating hath carried off the Diarrhy, it must also either very suddenly remove a continual Putrid, as also a malignant Fever, or at least very considerably abate it. But the case is otherwise, the Causes of a continual putrid Fever, and a malignant Fever, are much different, and are render'd much more by forcing Sweats in the beginning, as is observed before.

7. Wherefore I do much suspect, that there is scarce any Remedy us'd, that may be truly termed an Antifebril: though there are a great many that are in common use, and yet not commonly known, or acknowledged to be such, which, if well Dosed, and oft exhibited in proper Seasons, may evidently and sensibly be discovered by any heedful Physician, to subdue the febril Matter, though but slowly, and therefore ought to be began to be given very early, and continued. Besides these, there are other Medicines, which in Four and twenty Hours do abate all the common Symptoms in a continual and malignant Fever, though even these, if applied too late, the Spirits being then almost wholly subdued, and the febril Matter increased, and render'd indigestible, may fail in their Performances.

There is a Medicine I have oft prepared, but with much labour from a Mineral and Vegetable, which upon view of the Eye may be perceiv'd to lessen those dangerous Symptoms of a malignant Fever, or any putrid continual Fever, and speedily subduing the material Causes of the said Fevers, & exactly answering to the Indication that is drawn from them; I do not remember to have met with it in any Author, neither do I hear it was ever prepared by any besides my self. As for the *Peruvian Bark*, I have several times attentively observed, that the continual Fever being under very promising Circumstances, hath upon the use of it changed sensibly into worse Symptoms in six or twelve Hours, so that no means afterwards could

The Bark

Stupifying
Medicines
&
Opiates

could be applied capable to retrieve that Error.

8. Narcotics are seldom forgotten in this Distemper, especially where so seeming a relief is perceiv'd on a sudden, in the sudden suspension of its Symptoms, by detaining or holding fast of the Animal Spirits from Operating upon the Febril matter, that causeth these Symptoms, which soon return with a greater fury, upon the letting loose of the said Spirits, by the dissipation of the Force of the Hypnotic Medicine. This seeming Alleviation doth oft encourage the Physician to a continued use of Dormitives, throughout the whole course of the Fever, the benefit whereof is experienced, not only to consist in a longer delay of Death, but also in a more certain consequence of it. Notwithstanding this great abuse doth not remove the necessary, seasonable and seldom use of Narcotics, when and where urgent Symptoms may require them. This is most certain, that all *Narcotics* are diametrically contrary to the Animal Spirits, and the Nerves, and consequently all Nervous parts, and most pernicious in any Disease of the Brain, which if there was none before, the long use of 'em will infallibly cause one. On the other hand *Opiates* do effectually suppress all manner of Evacuations, except Sweating, which they promote, and therefore very oft they do put a stop to all sorts of Hemorrhages by Stool, Vomiting, Urin, and at the Nose; likewise to frequent Vomiting, and Diarrhæa's, or Loosenesses to a Miracle. So that it's no wonder to me, that Quacks do great things with *Opium*, I mean sometimes great Good, and very oft great Mischiefs. That seldom great good gives 'em, and keeps up their Reputation, so as to draw abundance of Patients to them, and the frequent great Mischiefs they do are as soon forgotten, as the Funerals they occasion. *Opium* is a Quack's Right Hand, and where ever you find a Quack without *Opium*, you may hang him. *Opium* he puts to his Balsamic Drops, to his *Sal Volatile*, to his Tinctures; and to every thing.

pernicious
to y^e Brain

C H A P. XI.

Of the Stone.

1. **T**HAT the Urin is saturated with *Sal Armoniac*, its Distillation doth plainly confirm to us, and that the *Serum* of the Blood, whereof the Urin doth consist, must first contain the same, or else the latter could not receive it; for *nihil dare potest, quod non habet*, and consequently that the whole Mass is thoroughly replenish'd with it, doth also appear from the Distillation of Human Blood, which yields a plain Spirit of *Sal Armoniac*, little or nothing at all different from the other. That *Sal Armoniac* is the most tough Salt of all others, cannot be disputed by those, that have pounded common Salt, *Sal gemme, nitri*, or any other Salt, in a Mortar, these being the most friable and brittle, and consequently the less unfittingly to be coagulated into a Stone; whereas *Sal Armoniac* being so tough and tenacious, especially being mixt with crude slimy mucous Dregs, that remain after the imperfection of the Digestion in the Stomach, together with some fabulous Matter of the Blood, I do conceive may easily be coagulated together by a vitious limpid gleet dripping out of the Nerves (as I have already mention'd in one of the preceding Chapters) that are disseminated through, and are terminated in the *Parenchyma*, and Membranes of the Kidneys. So that the pre-

The Stone
is not ingener-
ated by the
Heat.

tending that Slime adhering to the Kidneys, or its inward Membrane, is baked into a Stone by a preternatural heat of the Kidneys, like unto Clay baked in a Kill into a Brick by the extream heat of a Fire, seems a Jest to me, since it cannot be imagined, that any heat of that degree is ever felt by any Nephritick Patient; or, if possible, could it be endured by him. Moreover their pale Complexions,

pale Urin, Sluggishness, infrequent Urination, or making of Water, are all Indications of Coldness; add hereunto, that Chrystal is generally found, and probably bred in the Snow, Rocks, Flints, and other Stones in the Bowels of the Earth, where no degree of Heat was ever perceiv'd. Wherefore whatever extraordinary or preternatural Heat may be felt by Nephriticks about their Loins or Kidneys, is commonly caus'd by Gravel, Stone, or some other obstructing, or corroding Matter, occasioning Pain, and consequently Heat.

2. In what part soever this Urinous Salt, or *Sal Armoniac* is found, (through want of being separated and expelled by the Kineys) be it in the Guts, Urinary Bladder, Gall-Bladder, Liver, Spleen, Brain, Stomach, Lungs, in the fleshy part of the Tongue, and of the Kidneys themselves, also about the Joints, though as remote as the extremities of the Fingers, there Stones may be, and have been engender'd, as is attested by a multitude of Authors. Some of these parts being allow'd by most Physitians to be of a cold Temperament; as the Brain, Guts, Bladder, &c. is a second Argument, that plainly evinces, the Stone is not engender'd efficiently by Heat, though it may sometimes very considerably conduce to it. But to say, there is a *Lithopoetic* Faculty, or an Innate calculous and abulous Constitution in the Kidneys, as is asserted by so great an Author, as *Fernelius*; seems to be very idle; as if he would infer, that none were subject to the Gravel and Stone, but such as deriv'd Hereditarily a calculous, and calculous Disposition of the Kidneys from their Parents: What Satisfaction there is in the Word *Lithopoetic*, I cannot well apprehend.

3. Before I recede from this Subject, I ought to answer one Objection, viz. That there is not always mucous Matter concurring to the Generation of the Stone, as appears in the Stone, that is sometimes found in the Gall-Bladder of a Man, and very oft in that of an Ox, which consisting of Gall or Choler, cannot be supposed to have any Slime, Phlegm, or

or Mucous adjoyn'd to it, being for the most part found simple unmixt, and contrary to the Nature of *Mucus*, or Phlegm, which is always Glutinous or Viscous; I allow the whole, and make answer, that the Stone in the Gall-Bladder is oft formed by concretion, through the separating or drying away of its thinner and moister parts; in like manner Mortar dryeth in some time into a Stony Substance; as also doth *Tartarum Vitriolatum*, that's made by Concretion, besides many others; on the other hand I must tell you, I am not the first that hath observed the Gall in the Gall-Bladder very Viscous and roapy, through the admixture of some Slime or *Mucus*, that's separated with it from the Blood, and then it will be allowed to be Matter very proper for the Formation of a Stone. In the same manner a Stone in the Kidneys may be formed by Concretion, without the admixture of Mucous Matter, but then the Stone becomes friable, and not very hard, and of a more redde colour, whereas according to the proportion of Mucous Matter, concurring to the formation of the Stone, it becomes hard and pale.

The Stone of the Kidneys is commonly observed to precede that in the Bladder; and any Stone, though of a very small Dimension, falling from thence, through either of the Ureters into the Bladder, is conceiv'd to be the Foundation of one there, which by lying a considerable time, doth receive a daily growth from the Urinous Salt, and Slime, that descend thither. This in my Opinion is not always necessary, it being possible enough for a Stone to grow in the Bladder, without having the Rudiments laid in the Kidneys; moreover, it hath been observ'd, that at the same time one of the Kidneys, and the Bladder, have each contain'd a Stone.

4. To the formation of the Stone, must be concurring. 1. Depauperated or vitious Animal Spirits, that are too weak to perform the Separation and Expulsion of the abounding Serum of the Blood in the Kidneys. 2. A Serum too much Saturated with a *Salt Armoniac*, that's mixt with too much

Sal Ar-
moniac
how made

Things
bad for
the Stone

common Salt, which all Edibles do contain in some proportion, and so do Wine, Beer, Whey, and other Drinks; for you are to understand, that Sal Armoniac is a mixt Salt, consisting of common Salt, and a Fuliginous Salt, united together, as appears by the Artificial making of Sal Armoniac, which is by mixing a pound of common Salt, to half a pound of Soot, and boiling them in three or four points of fresh Urin, to the thickness of Honey, which is then to be sublimed in subliming-pots into Sal Armoniac. The natural Salt Armoniac is Urin of Chamels, Horses, or Oxen, concreated or Evaporated by the hot Sands of Arabia into a Salt. 3. A Slime or Mucous to Cement the Salt with the 4th, which is Sabulous Dregs of the Blood. 5. Narrow Passages of the Kidneys. So that Salt, Salt Meats, Pickles, and Spices, are chief Materials for the Stone. 6. A Vicious gleet dripping from the Nephritic Nerves, Coagulating the Materials together. This is the short Theory I do propose to my self, of the Generation of the Stone in the Kidneys, which is suggested to me by Practical Experience, though I could wish, that among so great a Number of very Ingenious Physicians we have here in England, (who are as capable as any in the whole Universe, though not so industrious) some would take the pains, to detect a more probable Theory of the Stone, and other Distempers, which would certainly prove a great Advancement to the Art of Physick, and no less Benefit to miserable Patients. However, as defective and Hypothetical only this Theory may be, it conducts me much more successfully in the Practick against the Stone, and other Diseases of the Kidneys, than the common Doctrine. I do own, that this and all other preceding Theoretick Notions might be render'd much plainer, by branching their Illustrations into so many particular Volumes; but my invincible Aversion to all manner of Prolixity, together with my weak Capacity of rendering them any more than scarcely probable, or other than merely supposititious, doth entirely discourage me from any such Attempt.

The

The Practical Part of the Stone consists in these Particulars; 1. In the Means to prevent the Growing of it. 2. In the Cure of the Stone. 3. In the Removing a Fit, or Paroxysm of Pains, occasion'd by the Stone. 4. In the preventing the Return of a Paroxysm of the Stone, which may be term'd a Palliative Cure.

1. Those that live Sedentary Lives, and use little or no Exercise, as most Students; and Debauchees in sharp Wines, and very new, or stale Strong Beer, are very Subject, and properly dispos'd to breed the Stone; but beyond all, those that eat much Salt with their Meat, or feed much upon Flesh or Fish Salted, Smoak'd, or Pickl'd. Wherefore interposing moderate Exercise between their Studies, and abstaining from their grave Thoughts, by intermixing Cheerfulness and Mirth, to alleviate the Animal Spirits, which are the chief Agents of Health, and being indispos'd, or vitiated, of Diseases. This is one Way to prevent the Stone in the former, And exchanging sharp Wines into milder, and diluted with a light thin Spring-Water, and using them with a *quantum sufficit*, and a total Abstinence from Stale Beer, substituted by Small Ale, will produce the like Effect in the latter. To drink Wine at Meals, as it lays a Foundation for the Stone, so using Small Drink in its stead prevents it: And in my Opinion, pure Wine ought not to be drunk, according to the Rules of Health, before the Chylification is finish'd, and the Distribution at hand, unto which it may be very assistent. A Fish-Diet moisten'd with too much sharp Wine, and a Bread and Cheese-Diet, seldom fail of administering sufficient Matter for the Stone. In short, Keeping the Stomach clean, in the manner as hath been before describ'd, is the chiefest Way and Means to prevent breeding the Stone.

2. The Cure of this Disease is commonly attempted by Bleeding in the Arm (tho' some judge it more advantageous in the Foot) in Bodies, that are moderately replete, to make room in the Vessel, which the subsequent Laxatives and Purgatives will neces-

Bad for the Stone

v. p. 11-20 26.

The Cure

farily require, as working by Fermentation, that will occasion a Rarefaction of the Humours, and consequently a Distension of the Vessels, which otherwise might cause some Local Disturbance of the Stone, or occasion a Paroxysm of Nephritick Pains. Among the Laxatives, *Cassia Fistularis* newly drawn over the Steem of a Decoction, made of Emollient or Diuresick Vegetables, is made choice of as a sacred Remedy, either by it self, or mix'd with Rhubarb and Cream of Tartar, or *Diasenna*; which is oft suspected, because the *Scammony*, that is an Ingredient in it, is accounted too rough, as causing too high a Fermentation, or Ebullition; or *Pulvis Senae comp. maj.* or *Pulvis Sen. comp. min.* This is judg'd necessary to be repeated once or twice, at convenient Intervals; which, as I have try'd more than once, I have always found, not to reach the Morbifick Matter, and therefore am oblig'd to make use of such Additions, that should penetrate without any Hazard of putting the Spirits upon a Ruffle. This being premised, the Saxifragers, or Stone-breakers, are to be introduc'd, with this Election and Preference, That those, which have an extraordinary Character stamp'd upon them by great Authors, or Physicians, ought only to be recited; for, should they all be enumerated here, to which the Faculty of Stone-breaking is attributed, a Quire of Paper would be insufficient to contain them, there being no Disease in the whole Body of Man, against which so many Simple and Compound Remedies (in all manner of Galenical and Chymical Forms) of Vegetables, Minerals, and Animals are recommended, as against the Stone; for I do believe I never met with a Physician, Apothecary, Surgeon, Empirick, Midwife, or any Old Woman, that had not an infallible Remedy against the Stone and Gravel.

But before I make mention of any of these Stone-Grinders, it will not be amiss to enquire by what Quality, Vertue, or Means it is expected by Physicians, they should perform this great Work of
Break,

Breaking the Stone in the Kidneys and Bladder. Some endeavour to effect it by Medicines, that have a Corroding Quality, by which insinuating into the Pores of the Stone, tear all asunder, and dissolve it, in like manner as *Aqua fortis* dissolves Silver, Copper, and Tin; *Aqua regia*, Gold; and Juice of Limons, and distill'd Vinegar, Crabs-Eyes, Pearl, Coral, &c. To this purpose, for Corroding and Dissolving the Stone, are recommended *Spirits of Vitriol*, *Sulphur*, *Salt*, *Nitre*, and *Juice of Limons*. I have experienc'd most or these in the Cure of the Stone, and ever observ'd, that within less than an Hour, they would certainly put the Patient into an horrid Fit of the Stone-Cholick, besides the Pain in the Back; against which, an Emollient Laxative Clyster, with the Exhibition of a gentle Narcotick at the end of its Operation, gave present Relief; and glad I was to come off so. That a few Drops of any of those recited Spirits, well diluted with Parsley or Fennel-water, and sweeten'd with Syrup of the five Opening Roots, being thus obtused, and afterwards broke in their Virtues, by passing the Stomach and other Parts, and carrying thence some slimy Particles to blunt them more, should at last, upon their Arrival to the Kidneys, be endu'd with a Force sufficient to crack a hard Stone, is very wonderful. But to clear the Point, pour Spirits of Vitriol upon Steel, as is directed in the Preparation of *Vitriolum Martis*, these readily entering the Pores of the Steel, whose Figures are adapted to receive them, move very quick and impetuously, piercing through the whole Body of the Steel in very few Minutes, whereby not only a very great Heat and high Ebullition are occasion'd, but the Sulphurous Particles, that ty'd the Salin together into a Body, are totally expell'd; as you may perceive by the great Stink attending of them in their Evaporation, and the Remainder is turn'd into its First Principle of Vitriol. In like manner the Spirits of Vinegar, or of Juice of Limons, piercing into the adapted Pores of Bezoar-stone, Pearl, Coral, Crabs-Eyes, Egg-shells, Oyster

and Muffel-shells, Crabs-Claws, and the like, by the quick and violent Motion of their most subtil pointed Particles, cause an Heat and Ebullition, and chase out the Sulphurous connecting Particles; whereby nothing is left in the Vinegar but a Tartar, (*Limus*, or *Fex*,) and if wash'd, may be call'd a *Calx* extinct, though honour'd by Chymists with the Name of *Magistery*; that is, after the Precipitation with Oil of Tartar, and the sweetning of it with several Lotions of warm Water; which, in reality, is no more than a *Terra damnata*; and among those recited, I take the Bezoar-stone to contain the finest Earth; and next to that the Pearl. As for the rest, I look upon them all as equal.

Now if you can suppose the Pores of a Nephritic Stone in the Body, to be adapted with Figures, answerable to receive the pointed Particles of the Spirits of Vitriol, Salt, Nitre, Tartar, Vinegar, or Limons, you may reasonably believe, there is a Virtue and possibility in these Acids, of dissolving the Stone in the Kidneys or Bladder, notwithstanding that they are not taken in so great a quantity, as almost to corrode, and that they do not arrive in their full force to those remote Places; yet their frequent Repetitions, and long continuance of them, under a colder Virtue, will answer their impropor-tionable doing, and accomplish the same effect: So that if this supposition were true, as it is most certainly false and erroneous, you are not to apprehend, that those Acid Stone breakers were to perform that Work, in the time almost that you may crack an Apricock Stone, as most of the Medicine-mongers and Empiricks pretend to do, in twice or three times taking. But to subvert your Supposition, and consequently to divert you from losing your labour in the use of Acids, I need only to alledge to you, that they are in no wise shaped in the figures and dimensions of their Particles, proportionable or adapted to enter the Pores of a Stone bred in the Kidney or Bladder, as you may easily make trial, by pouring off Spirits of Vinegar, (I mean, Vinegar

gar twice or thrice distilled) Juice of Limons, or simple water acuated with such a proportion of Spirit of Vinegar, or Juice of Limons is (for above that degree, no Acid can be taken into the Body, without corroding the Stomach) upon an indifferent hard Stone, taken out of the Bladder or Kidneys, which being inclosed in a Matrafs with its blind Head, and placed in a warm Sand Bath, for Twenty Weeks together, at the expiration of which, you may take out the Stone, so far from being pierced by the Acids, that it's grown much harder than it was before. But what is more, should you pour the strongest *Aqua Fortis*, or *Regia*, or Spirit, of Vitriol not diluted, upon it, and let it stand as long as you please, the Stone will come out harder than it was put in. As Gold and Silver cannot well be reduced, or dissolved into a *Calx* by ignition, but by amalgamation, and immerfive (as the Chymists term it) Calcination by corrosive Acids; so on the contrary, the Stone that's bred in the Bladder and Kidneys, cannot readily be dissolv'd into a *Calx*, by an immerfive Calcination, but by Ignition. *

* Because the Sulphur, that is the constituent parts of the Stone together, can only be consum'd or destroy'd by fire, whereas no acid will, or can attempt upon Sulphur.

3. That all Acids (*Quatenus* Acids, and *per se*), *All Acids are Enemies to the Nerves*, nervous Parts, (as Membranes, Tendons, &c.) and to the Animal Spirits, *to the Nerves*; common experience doth attest; whence it is, that most Men, upon only tasting of a very sour thing, being Potable or edible, are apt to make sour Faces, and to shiver, or to undergo small Tremblings all over, (which are small concussions of the Nerves, Tendons, and circumvestient Membranes of the Body) by pricking of the Membranes; and though this Pricking in tasting of any very sour thing, is only perceiv'd by the Nerves and Membranes of the Mouth, it is nevertheless felt all over by the continuity and contiguity of all the Nerves, nervous Parts, and Membranes of the Body, like unto two, or more unison

unison Fiddle-strings, whereof one being touch'd, causeth the same sound in all the others; or like unto a Cord that's extended, which when smartly struck at one end, makes the whole Cord shake as far as the other end; whence I do infer, that what ever expulsion, whether by Vomiting, Stool, or Urine, (and sometimes per accidens sweat) is occasion'd by the force of Acids, is by pricking, stimulating, or irritating the Nerves, or nervous parts, by their rigid Pointed Particles, and a faculty, (which all Acids possess, contrary to all fuliginous and armoniac Salts) of precipitating of them, and consequently throwing of them down the Ureters; and therefore I doubt not, but that in some kinds of suppression of Urine occasion'd by the Stone, Gravel, Mucus, Crumbs of Blood, and at some seasons, Acid Medicines may be of great use, among which, I do in my opinion prefer this following.

Acids -
stimulat

For a sup-
-pression
of Urine

Rx Aceti Vini albi Gallici destillati, (vel si mavis, succi Limonum, vel citri, cujus posterioris usus prestat) ℥j. Ol. amygdal. dulc. rec. extract. ℥iſſ. probe & diutius cum Sacchar. candi vel Sacchari Albae. ℥iſſ. triti. vin. alb. gall. ℥iij. M.

This proves very diuretick in many, and that by stimulation, as I have said before. But it's observed of Juice of Limons, that if frequently used, it's apt to cause a Thrush in the Stomach, by its too sharp, or rather somewhat corroding quality, occasioning sometimes Vomiting, or a violent Looseness, for which reason the Juice of Citron is preferred, consisting of an Acid not so acute, and yet not less diuretic. However, White-wine Vinegar distill'd, is experienced to excel either of them in a diuretic Faculty, and many others, as being much more penetrating, and consisting of Particles more subtil and Volatil. Though Vinegar is vulgarly reputed a potent restrigent, yet it cannot deserve that denomination so much as Spirit of Salt, Nitre, Juice of Limons, or the acid of Tamarinds; and to speak truth, it cannot

cannot properly be term'd Adstringent, which is a quality that's binding, pursing, (drawing together like a Purse) and contracting, proceeding from austere Particles, such as are perceived in Allom, Juice of Slows, and the like; but nothing resembling that, can be discover'd in Vinegar, no more than in Juice of Limons, or Spirit of Salt. True it is, that all Acids cause an Asperity or Roughness by their acute Particles, pricking the Nerves and Membranes, that are nervous expansions, which by a sort of resistance rise up into those minute Points, * thereby endeavouring rather to expel * *Like into a Goose.* and throw out; whereas the others by their Austerity, though occasioning a Roughness, yet it is such, as doth detain, and bind in whatever they contain: What is in Vinegar, but an Acid Spirit, united to an Acid Tartar, melted as it were *per deliquium* into a Moisture or Liquor? Vinegar is so far from binding, that it renders any thing, to which it's united, more piercing, expulsive, and solutive also, as appears in *Sal Tartari Sennerii*. *Colocynthis* steep'd in Vinegar, is render'd much more purgative, than when macerated in Brandy or Wine. Three Grains of *Laudanum Opiatum* taken to cause Sleep, and drinking upon it a Draught of any Julep, that contains an Ounce of distill'd Vinegar, or only as much *Oxymel Simplex*, shall occasion a deeper Sleep, than if ten or twelve Grains of *Laudanum* had been swallow'd, whereout probably some would never awake again. Other upon drinking of sour Beer (being of the same nature as Vinegar) are immediately put into Gripes and Looseness. However I will not be positive in this, or scarce any thing else; but to me, the Adstringent quality in Vinegar seems a vulgar Error of some Ages.

That Acids (excepting those that are merely Austere) are the chief and most proper Medicines (I will not say certain, for they don't prove always so) for Expulsion, and promoting or irritating the

Vinegar

Expultrix Faculty efficiently in the Animal Spirits, and Instrumentally in the Nerves and Membranes, may be Instanc'd in Vinegar, which in a greater quantity provokes Vomiting, in a lesser, Stools and Urin, and Sweat in those that are disposed. It is certain, that *Prophylactic* Waters made by Infusion, and not distillation, being commonly well impregnated with Vinegar, and *Acetum Theriacale* are incomparatively more ready and potent in half the proportion, in promoting Sweat, (which also is by expulsion) than Treacle-water, (wherein is contain'd only the Phlegm of some Acids, the heavier and stronger part not coming over the Helm in distillation) *Aqua Epidemica*, or *Protheriacalis*. One Dram of *Virginian Serpentry*, being macerated in Vinegar, shall raise a quicker and more copious Sweat, than three Drams infus'd in Wine or Brandy. Cream of Tartar, and Tamarinds, by their pungent Acidity, move the *Expultrix* Faculty of the Guts to Stools. Juice of Limons, Citrons, Oranges, Spirit of Tartar, Nitre and Salt, prompt the Kidneys to expel Urin, &c.

4. *Spiritus tartarii*, *Nitrum tartarificatum*, and *Tartarum Vitriolatum*, are by most that have made tryal of them, accounted the most powerful of Diuretics. But there being so offensive an empyreumatic stink in the Spirit of Tartar, proceeding from a remaining Admixture of some lixivial Earthly Particles, imperceptible to the Eye, whereto the *Empyreum* is almost inseparably adherent, causeth its use to be much neglected, which however may be removed, by mixing the Spirit with fine wheaten Flower into a Paste, and that equally mix'd with the *Caput mortuum* of Vitriol, and so drawn off twice or thrice in a Glass retort; or mixing the Spirit of Tartar with *Colchotar*, i. e. *Calchantum rubefactum*, and drawing it over once or twice in the same manner; wherein you need not to fear, that any Vitriolic Spirit will mix with it, in regard that the degree of heat, that will be sufficient to raise the Spirit of Tartar, is not by much intense enough, to force

force out the Spirit of Vitriol. After all, a pure *Acetum distillatum* is not much inferior to it.

5. By what means those Magisteries of Crabs-Eyes, of Mussel-Shells, Egg or Oyster-Shells, operate those pretended effects of forcing down Urin, and breaking the Stone, is my next business to enquire. It is commonly concluded, that whatever drives down Urin forcibly, doth break the Stone by oft dripping upon it, like the dropping of a Gutter falling oft upon a Stone under it, doth by length of time make a hole into it. *Gutta cavat Lapidem non vi, sed saepe cadendo.* It is thence inferr'd, that those recited Magisteries are potent Diuretics, (which my little experience doth wholly contradict,) but whether they do their work by cutting, hammering, or dissolving the Stone *tota substantia*, ought to be consider'd. It cannot be pretended, that in those Magisteries, and particularly in that of Crabs-Eyes, there is any thing besides a fine Earth, the Acid Particles of the Vinegar, having entirely driven out the sulphurous Particles of the Crabs-Eyes, and seated themselves in their rooms and Pores, which they had left; so that you are not to apprehend, that the Vinegar is thereby sweetned, because the Alcalious Particles (which in them ought not to be so call'd, for they are not such) are mortified or broken, and thereby the Liquor, wherein the acid Particles were, remains inspid; no, this is quite otherwise; for the same Acid or Vinegar Particles are still in being, having only changed their place; for put the whole solution together, viz. the inspid Liquor, and impregnated fine Earth of Crabs-Eyes into a Glass retort, and being placed in a Sand Furnace, you will by distillation with a smart heat, have your Vinegar return'd to you again, not at all, or imperceptibly little impair'd in its sharpness, or lessen'd in quantity; so that this pretended *Magistry, Solution, immersive Calcination*, or what else you please to call it, is nothing else, but a concentration of the Spirit of Vinegar, in the entirely destroy'd Crabs Eyes, which being wash'd off from

Egg & Shell
22.

from the saline acid Particles of the Vinegar, or first being precipitated by the instillation of Oil of Tartar, and afterwards wash'd with repeated lotions of warm water, is left not worth a straw, and fit for nothing but to make a very indifferent Fucus, or Cosmetic, which that of Egg-shells doth by much excel. Wherefore Crabs-Eyes by Triture upon a Porphir reduc'd to an Impalpable Powder, and exhibited in a convenient Vehicle, do in a Moment remove that troublesome Symptom, improperly call'd the Heart-burning, by admitting the acute Particles of the almost corroding acid Liquor (floating in the Stomach, and vellicating its Nervous Tunicks) into their minute Recesses, whence the Sulphurous Particles were so suddenly chac'd; and if upon this the Patient takes twelve or fifteen Grains of pure Chrystallized Salt-Petre, (not *Sal Prunella*,) in a draught of Barley or Milk-water, at a few Minutes distance, he shall perceive the Crabs-Eyes, with the contain'd corroding Particles, sensibly precipitated into the Guts.

6. Crystallized Nitre is certainly the most wonderful Salt of any, and the most active and potent Diuretick, or Piss-driver, of all the whole Catalogue. It is a Salt entirely consisting of Sulphurous Spirits or Particles, concentr'd or clos'd up in a very little Saline Matter: Its Activity and quick impetuous Motion is beyond all others, except Mercury; for no sooner can you touch your Tongue with it, but immediately its subtile Particles enter the Pores of the Moisture residing in the spongy Recesses of your Tongue, and of the Spittle about it, which they divide, attenuate, expand, and dilate, or rarefie so very quick, that your Mouth seems to run over with Moisture in an Instant. This Nitre, or Chrystal Mineral, being taken in a proportionable Dose, in a sufficient quantity of a suitable Vehicle, doth soon after rarefie, attenuate, and tumesce all the Humours, Liquors, Serosities, and Moistures it meets with in the Stomach, and other Bowels and Passages, whereby the thinner Parts are separated, thrust forward, squeeze'd,

Heart
Burn.

Nitre.

Squeez'd, and expell'd towards the Kidneys, and thence to the Ureters and Bladder; so that I have not yet found any thing comparable to it for a Piss-driver. That I do prefer it thus unprepar'd before *Sal Prunelle*, is, because by the melting and inflaming *Sulphur* upon it, a great part of the most active and penetrating Spirits, and most subtile Particles are driven out, and consequently much enfeebld. But perhaps you may reply, That their crude Particles are by the inflaming of the *Sulphur* expell'd, and the Nitre thereby digested; which is all fantastick. Beside this extraordinary Virtue, these Crystal Minerals have a Power so surprising in the Thrush of the Mouth, Internal, and External Inflammations, and many other Diseases, that 'tis a great Wonder to me, it is no more taken notice of in Physick.

7. To return to the Remainder of Enquiry into the Manner and Ways, whereby these Virginal Earths of the aforesaid Testaceous Magisteries do drive down Piss; upon the strictest Search my slender Capacity can make, I do not find any thing to attribute that Faculty unto, except to little cutting pointed Sands of those Earths, that by pricking the Membranes of the Stomach, Guts, and other Parts, they stimulate them; and by Contiguity, and Continuity of Parts, stimulate all the Membranes of the Body to expel loose, separated, and floating Serosities to the Kidneys and Ureters. That by pricking one Membrane, you do, as it were, prick all the rest, appears in the Instances above-written, of a Touch upon a Cord extended, or a Sound made upon one Unison; and by the pricking of the Membrane of the Tongue by any very sour Taste, all the Membranes of the Body seem to be affected with the same little Punctures, as appears by sudden small Shiverings of all the Body over; as likewise, in another Instance of the Bladder, which oft, upon having made Water newly, the Air from without presses into it, to fill up the *Vacuum* in some measure, whose Nitrous Particles wherewith it is re-

p. 22.

pleted,

repleted, do prick the Membranes of the Bladder; upon which a sudden Shivering (which is an Attempt or Endeavouring of Expelling) happens all over the Body, by the propagated Sense of pricking to all the Membranes.

Glas

8. 'Tis in this respect, that Glas being powder'd, is also recommended for a potent Diuretick, by reason of those acute cutting or pointed Particles, that are suppos'd to be in it, which pricking and stimulating (being likewise accompany'd with Weight, that contributes very much, and therefore ought to be administer'd in greater Quantities, than are usually given) the Tunics of the Stomach impel Serosities to the Kidneys in manner before express'd. Upon the same Consideration it is, that *Lapis Judaicus*, *Lapis Nephriticus*, *Lapis Spongia*, Medler-stones and probably Peach and Apricot-stones, Mountain-Crystal, *Lapis Lyncis*, little Stones that are found in the Stomach and Gall-Bladder of an Ox in the Month of *March*, in the Liver of a Wild-Boar, in the Head of a Perch, and in the Throat of a Carp, and the Stones that are taken out of the Kidneys and Bladder of a Man, and indeed all other hard Stones, that being reduc'd to a Powder, do still retain some acute cutting Particles; for if any hard Substance be finely pulveriz'd, and afterwards grind'd into an Alcohol, or impalpable Powder, upon a Porphir, so as all the Points of the Minute Particles are obtus'd, and entirely broke, it loseth all its Diuretick Virtue. Wherefore it is, that the Magistery of Crabs-Eyes, and other Testaceous Bodies are so far from being Diuretick, that they prove Emplastick, and consequently putting a stop to all manner of Expulsion. For the Reasons all'dg'd I am of Opinion, that Crabs-Eyes, Coral, Bezoar, and the rest of Testaceous Bodies are destroy'd by all manner of Preparations, (whether in order to Magisteries, Tinctures, Salts, or Deliqueous Oils,) except moderate Pulverisation, which renders them more susceptible of Acid Salts, whereof the Moisture or Liquor being disrob'd, now serves for Increase of Serous

rous Matter, that is to be expell'd to the Kidneys for the Matter of Urine, or the Ambient Pores of the Body for the Matter of Sweat, whereunto the Membranes are stimulated by the Acid Spirits, wherewith the Testaceous Powders are impregnated.

9. Among the pre-cited Stones, Dogmatists pay the most Respect to the *Nephritick Stone*, and *Crystal*; which latter, when brought into a Powder, by how much it remains more hard, subtile, and consisting of acuated and pointed Particles, so much the more it is adjudged to exceed Glass in a Diuretick and Saxifragous Quality, both operating in the same manner, and by the same means. As for the *Nephritick Stone*, *Nephritick Stone* there are such wonderful Stories recorded of it, that I am almost asham'd to offer the Recital of them; and at the same time, am surpriz'd at the unlimited superstitious Belief of Mankind: Before I proceed, I ought to give you some Description of it, that you may not be impos'd upon by a false one. The best of these Stones are brought from *Turkey*, and the *Spanish West-Indies*, which they call *Igiada*; though some slight ones are sometimes taken up in some Parts of *Bohemia*, *Spain* and *Carniola*: Others are of a very considerable Weight and Bigness. They are fine Stones to look upon, of a dark green Colour, clouded, though some are of a lighter Green; the Surface feels always greasie. 'Tis reported by some, that this *Nephritick Stone* being grinded into a fine Powder, or prepar'd (probably) by Calcination, or making it red-hot in a Fire, and afterwards quench'd in strong Vinegar, whereby it is easily reduc'd into a subtile Powder, and given to the quantity of a Dram and an half, in Fennel or Parsley-Water, doth in a Moment remove the violent Pains in a Fit of the Stone; and being taken three or four times, doth in a wonderful manner dissolve the Stone into Slime, Mud, Gravel, and Crumbles, as they pretend to instance in the perfect Cure of abundance of Nephriticks in *Germany*, where their Wines, and the common Excess in drinking of them, do in abundance of People breed Stones in the Bladder and

Kidneys. They add further, That if it be given in too large a Dose, or taken too oft, it breaks the Stone so fast, that the Mud and Gravel, into which it is dissolv'd, come down so fast, that they are apt to dam and choak up the ways, as containing too little Room to give Passage to so much Rubbidge.

10. But the Excellency of this *Lapis Nephriticus* consists more in the External Use of it, than Internal, the various Narratives whereof appear wholly incredible. Authors tell you, That being worn on the Wrist, many have been cur'd by it, who could not receive the least Benefit from any other Internal Medicine. Another Author tells you, That by wearing a piece of this Stone about the Neck, next the Skin of a Person that was miserably troubl'd with the Stone, which though stubborn to all manner of Remedies, yet in a short time was so dissolv'd into Gravel, that was not only avoided at the Bladder, but by the Corners of the Eyes, through the Pores of the Skin by Sweat, and by Stool also. The same Author confirms the Truth of this, by the like Success upon a great many others. *Monardes lib. de occult. Medicam. propriet.* adds, That a certain Dutcheſs, whom he names, had undergone three Fits of the Stone in a short time; but upon wearing Bracelets made of this Stone, she had been freed of them for ten Yearstogether. The same Author reports further of a Nobleman, that was afflicted with the Stone; who, upon the wearing the Nephritick Stone about his Arm, was used to throw off such vast quantities of Gravel, that he was forc'd sometimes to leave it off, for fear the avoiding so much at a time might do him some Hurt. The Excellencies of this Stone are further display'd, by their producing several Instances of Persons, that have been cur'd of those incurable Catarrhs, or Defluxions of Rheum upon the Lungs, of Dropsical swell'd Legs, of any sort of Suppression of Urine, and of Ædematous Swellings in other Parts; all which was effected by expelling Urine in great quantities: And as a Proof that all this was to be attributed to the Virtue of this Stone, they tell you, That
upon

upon leaving off the wearing of it, those Distempers would return, and as soon cease again, as the Application of the said Stone was renew'd. They further add, That sometimes it would move Stools as violently, as if caus'd by a strong Purgative. But one great Inconvenience they mention the wearing of this Stone is attended with, *viz.* of causing a very troublesome Itching all over the Body; which would at any time be remov'd by leaving off the Stone for two or three Days, but return again upon the Re-application.

I I. Chymists set no less Value upon the Stone, that is taken out of a Man's Bladder or Kidneys, and is call'd by them *Ludus Paracelsi*; the Preparation whereof consists only in calcining it with a vehement Fire into a Salt, and letting it turn into an *Oleum per Deliqueum*, by standing in a Cellar, or other damp place. Whatever Vertue may be suppos'd to be in the aforesaid Stone, is to be attributed to the *Sal Armoniac* that is in it; which, whether it be not destroyed by Calcination, may justly be doubted; and therefore, the Urine newly made by an healthful Young Man, using Wine, doth seem to be endu'd with a greater Diuretick and Stone-breaking Powder: To which purpose, I have known several Nephriticks have chosen to take several Draughts of their own Urine (as having an Aversion to that made by others, who possibly may be diseas'd of some foul Distemper, or other) for many Days together, with good Success: For which Reason, Physicians do rather chuse to recommend Goats Urine, which is impregnated with much more *Sal Armoniac*, than that of any other Animal; and herein they all agree, being thereto induced by the manifold successful Experiments upon Nephritick Patients, that it excels all other Diuretick and Stone-breaking Medicines. The aforesaid Urine must be saved, by tying a Bladder to the Goat. Others prefer the Blood of a Goat dry'd, as not only containing a great quantity of *Sal Armoniac*, but its other Particles being dry'd, are harden'd into Cutting Acute Sands. Both the one, and the other, ought to be us'd in large Doses, frequently

ly repeated, and continu'd for several Weeks, if any great matter is to be expected from them.

12. In Conclusion, my Opinion touching the Virues of those pre numerated Stones is, That Flints being render'd brittle by Ignition, and Extinction in Water, or Small Beer, or Wine, wherein a good Lump of *Sal Armoniac* hath been dissolv'd, and afterwards grinded into Powder, and taken in large Doses in a Draught of the same Liquor, wherein it hath been quenched, may be endu'd with a far greater Power to drive down Urine, Slime and Gravel, and dissolve the Stone by a long continued Use, than any of the most celebrated of them.

Because those that are troubl'd with Gravel or Stone, are almost perpetually upon dribbling, which is increas'd by all sorts of Moisture they can or do drink, whether binding, stopping, attenuating, laxative, or endu'd almost with any Quality, be it ever so contrary to the Stone, or Gravel; for it all runs to the Kidneys, as being the Parts affected, (as I shall further explain below:) And for that Reason, almost every thing is by the Physicians call'd Diuretick, tho' operating by Qualities wholly repugnant to that sort of Evacuation. Hence it is, that *Porcelane* (tho' adstringent, and binding, and consequently, contrary to a Diuretick) is in *Consil. Cratonis* mention'd, to expel the Stone to a Miracle; and by *Rondeletius* said to break the Stones of the Kidneys. And *Knot-Grass*, as astringent as it is, is by *Matthiolus Com. in 4 cap. lib. 4. in Dioscorid. Solenander, and Mizaldus Cant. 4. Distinc. 4.* asserted, to expel the Stones of the Kidneys and Bladder. Also, *Rupture-wort*, no less binding, and restringent, is highly recommended by *Rondelet in Consil. 150. Craton. Gesner, and Quercetan. in Pharma. rest. cap. 10.* for a most effectual Plant to break the Stones in the Kidneys. And *Moss* that grows on the Ground, a potent Restringer, is by *Durandes in Hort. Sanitat. Heurnius, and Lonicerus*, mention'd to be a certain Stone-breaker. *Plantane*, that noted Adstringent, by Mr. Ray; and *Oaken Leaves*, a greater Adstringer

ger, by *Platerus*; and *Cinquefoil*, by *Scroder*, are recommended for Diureticks, and Stone-breakers; besides many other Adstringents that can be nam'd. Moreover, it may be taken notice, that most other Vegetables, Animals, and Minerals are highly commended, tho' specifically appropriated to some part or other: As among Cephalicks; *Pyony*, by *Trallianus*, *Dioscorides*, *Durandes*, *Lonicerus* and *Fernelius*; *Betony*, by *Galen* and *Matthiolus*; *Calamus Aromaticus*, by *Taberne Montanus* and *Solenander*; the Rind of a *Bay-Root*: And among the Pulmonicks, or Thoracicks; *Maiden-Hair* and *Carduus Benedictus*, and all other kinds of Thistles; *Eryngo*, *Figgs*, and *Liquorish*: Among the Cordials, *White Dictamnium*, and most (if not all) Aromaticks or Spices, which you may find mix'd in the celebrated Compound Diuretick and Stone-grinding Electuaries, and distill'd Waters: Also among Spleneticks, *Tamarisk*, *Spleen-wort*, *Roots of Cap-per*; *Mugwort*, and others, among the *Emmenagoga*; most of the Hepaticks; among the Anti-Scorbuticks, all, or as many as can be found, tho' more particularly, *Black Radish*, and *Horse-Radish*; all the Vulneraries, chiefly *Galen-Rod*, and *Speed-well*; besides a great Number of Miscellanies, appropriated to several Bowels, and particular Diseases; as *Birch-Tree*, *Guaiacum*, *Dropwort*, *Grass-Roots*, the five Opening Roots, and their Seeds, *Burnet*, *Saxifrage*, *Horse-Mint*, *Samphir*, *Ashen-tree-wood* and *Bark*, the Juice, of *Birch-tree*, *Nettle-Juice* and Seeds, *Valerian*, *Orry*, *Elicampagne*, *Bramble-roots*, *Soapwort*, *Bastard Rhubarb*, *Asarabacca*, *Wake-Robin*, *Baife*, *Onions*, *Squills*, *Garlick*, *Cabbage* and *Colewort-Leaves*, *Lovage*, *Garden-Madder*, *Birchwort*, *Restharrow*, *Featherfew*, *Penny-royal*, *Tansie*, *Origan*, *Spignel*, *Poley*, *Calaminth*, *Hyssop*, *Pellitory*, *Germander*, *Groundpine*, *Vervain*, *Southernwood*, *Strawberry-leaves*, *Willow-leaves*, *Water-Germander*, *Wild Thyme*, *Skirrets*, *Chamomil*, *Larkspur*, and *St. John's-wort-Flowers*; besides abundance of other Roots, Leaves, and Flowers, which by one approv'd Author or other are all esteem'd Diureticks, and Stone-grinders, as well as all Carminative Seeds, viz. *Parsley*, *Fennil*,

*Cummin, Anis, Dill, Carui, Daucus, Cardamom, Marsh-Parsley, Lovage, Sefeli, Gromwel, Parsnips, Macedonian Parsley, Broomseeds, Coriander, Garden-Cress, Basil and Fennel-Flower, the four great and lesser cold Seeds, of Mallows, and Marsh-Mallows, Cotton-seeds, Linseed, and Fanugreek-seeds, &c. Lupins, all manner of Vetches, Millet, Red Cicors, Bay and Juniper-Berries, Berberries, Winter-Cherries, Hipps, Bitter Almonds, Peach, Apricot, Cherry, Walnut, Plumb, and Hazel-Nut Kernels, Among Gums and Resins; Gum-Elemi, Arabio, Dragant, Olibanum, Bdellium, the Gum of a Cherry, and Plumb-Tree, Gum-Lac, Therebinthin Amber, &c. Among the Animals, the Ashes of an Hedge-Hog, of an Hare, of Swallows, of an Ass's Liver, of the Feathers of a Goose and a Ring Dove, and of Earth-Worms; the Skull of a Man powder'd; the Jaw-bone of a Pike, and the Parings of an Horse's Hoof, powder'd, Mouse-Dung, seven or Nine for a Dose; Pidgeon's Dung, Pullet's Dung, Sows (*Millepedes vel Aselli*) Grass-hoppers dry'd, Beetles, the Powder of an After-Birth dry'd in an Oven, the inward Skin of a Cock's Maw dry'd, the Guts of a Swan, the Powder of a young Pidgeon dry'd in an Oven; the Powder of the Bird Wagtail, dry'd by the Smoak of a Chimney; the Ashes of a Froglake Sparrow, (of which abundance of Authors speak Wonders;) the Blood of a Fox, drunk warm, as it comes out of the Veins; the little Bone taken from the hinder Knee of an Hare, (greatly extoll'd by *Forestus* and *Bernelius*;) *Cantharides*, which some Authors tell you, may be given in a total and long-continued Suppression of Urine, caused by the Stone, which if not remov'd, the Patient must die; and therefore as a desperate Disease requires a desperate Remedy, some that have more Courage than Discretion, have adventur'd to give it in a Dose, from Half a Fly, unto a whole one, powder'd, in a Draught of Clarify'd Whey, Emulsion of the four greater cold-Seeds, or Skimm'd Milk once boild up, and grown to be luke-warm, with very ill Success; for considering, that the Patient's Strength is reduced to a very low and deplorable State, before it is ad-*

minister'd

minister'd, if peradventure the venomous Medicine hath wrought through, so as to strain or squeeze out some Drops of Urine, which appears bloody also, it hath left such a painful burning Stranguary, which, with the Addition of the Nephretick Pains, and Defect of Spirits, hath soon put an end to the miserable Sufferer; so that it had been better to let a Man die, than to kill him: But where that Medicine doth not pass, it doth infallibly torture the Patient out of his Life. However, if any be fond of the Use of them, they must either toast them, and half, or wholly calcine them into Ashes, which then will have entirely divested them of their Diuretick Faculty, no other Virtue remaining in them, than what is in the other Ashes; or calcine them by Corrosion, dissolving them in Spirit of Salt, or Nitre, whereby their venomous Quality is much infring'd, and the Diuretick in a great measure preserv'd. The Toasting is in holding them over an hot Fire in an Earthen Pan, and their stirring them, until they fall almost into Powder, which doth greatly abate their Venom, together with some part of their Diuretick Power. In the same manner Beetles (*Scarabæi*) may be serv'd, being not very much inferiour to the afore-mention'd *Cantharides* in their Pilling Faculty. The Case being well consider'd, where Diureticks exhibited in large Doses, and frequent Repetitions, do not answer the End, 'tis most certain, the true Cause of the Suppression of Urine is mistaken; and consequently give what you please of that kind, it will prove unsuccessful; for a very small Remedy, if it hits the Cause right, doth ever bring sudden Relief; and therefore in such Cases, we ought to use our greatest Industry, in enquiring what other Cause may in all probability cause such a Suppression, and not persist in an Opinion, the first Appearance of the Distemper hath put us in. *Cantharides* may be a useful Medicine externally apply'd, but a very suspicious one; internally des

Trial of infusing two Drams of them in a Quart of French Brandy, and being filter'd through a Paper,

have given thereof, from one Spoonful to two, in Clarify'd Whey or Pistane, against inveterate virulent Gonorrhæas, but I could never find I advanc'd much in the curing of them.

I have here got together a large Catalogue of *Diuretics* and *Lithontripics* in Simples, yet it is not a compleat one; for upon a further search of Authors, it may be increas'd to double the Number, so that as far as I observe, no less than the whole internal *Materia Medica*, even the addition of Purgatives and Vomitives (which seldom move Stools without provoking Urin) cannot be sufficient to make up a full and compleat List of Piss drivers and Stone-grinders. The cause of increase of so great a Number of these, I can assign to no other, than to an incautious Credit Physicians have given to all sorts of People, that upon pretence of being troubled with this or that sort of suppression of Urin, Strangury, or other symptoms of the Stone, have declar'd a relief they receiv'd from this or that Remedy, though never so contrary, improbable, or preposterous (as you may perceive by the aforesaid recital of Simples, and other Compositions thence fram'd), without examining the bottom, the possibility or probability, and manner of acting of such like Remedies, in respect of the Indications, that ought to be taken from the Disease it self, the Causes thereof, the Symptoms, and chiefly from the *Actio lesa* of the Kidnies, which cannot well be performed, without the true Knowledge of the Function or Action of the Kidnies, and their *Modus agendi*, which (and indeed the Function of all the Bowels, and the *Modus agendi*) in my weak Opinion is stubb'd over, or at least very insufficiently discours'd, so that it's scarce possible to give any good Judgment of it. In order to that, I shall presume to set down some Positions, which (to speak modestly) you may please only to take for Suppositions. 1. That the Antecedent Cause of a *lesa mictio* is very oft in the Kidnies, and consequently that the Causes of a total or partial suppression of Urin, a Strangury, a Diabetes, (which is an *Aucta mictio*) *Ardor Urine* and other

other symptoms are in the same part. 2. The Office or Function of the Kidnies being chiefly the separation, and excretion of the *superfluous serum*, all, or most liquid or potable Matter, that's admitted into the Body more, than is necessary for the Blood to be supply'd with, doth naturally and by inclination (if I may so speak) flow, and tend or is impell'd by the Spirits, or (if you like the Expression better) by the parts of the Body to the Kidnies, especially if in any wise preternaturally affected; the reason is, because the Spirits (I mean the Animal) chiefly flowing to succour any part that is in distress, and they being the only and chief Impulsors of all the Humours in the Body, it must follow, that all Potables, be they adstringent, gross, thick, thin, sharp, sweet, sour, or indued with any other Quality, must be impell'd to that part, whither the Spirits flow most, which must be to the Kidneys, if preternaturally affected. Hence it is then, that Physick Authors observing all manner of Simples and Compounds, being either potable of themselves, or given in any thing that is potable, do provoke Urin in those, whose Kidnies are any wise preternaturally affected, have taken in so many hundreds of Simples and Compounds, to the almost innumerable Number of *Diuretics* and *Lithontriptics*, tho' far from being to be esteem'd as such, either by Reason or Experience: for to assert that Adstringents (as many of the reputed *Diuretics* are) do move Urin otherwise, than Medlars do Stools (*per accidens*) *comprimendo*, cannot be thought reasonable: And daily Experience doth prove that many *Diuretics*, that are suppos'd to be properly such, are taken in large quantities, by those that are in Health, without adding a drop of increase to their ordinary measure of Urin, as appears by those that have continu'd the infusion of *Millepedes* in their Drink for a considerable time, and in others that drink great Quantities of *French* and *Rhenish* Wines, without any proportionable increase, and sometimes scarce piss before the next day, which, as I said heretofore, renders the Operation of *Diuretics* very uncertain;

uncertain; whereas other Evacuatives, as Vomitories and Purgers, have a more certain Operation in most Bodies.

The Method of
agendi of
the Kidnies
 As to the *Modus Agendi* of the Kidnies in their Function, I cannot Imagin, that the *Serum* is separated from the Blood in their *Parenchyma*, colando (as it is commonly expressed by Physicians) by being strained thro' their narrow Passages, as if it were by a Sieve; because the *Serum* is so thoroughly perfused and mix'd with the Blood, which in many bilious Constitutions is as thin, if not thinner than the *Serum* it self, that consequently the Blood must pass with it, which would always occasion a bloody Urin. So that there must be another sort of separation, conceived by me, to be efficiently performed by the Animal Spirits, which you are not to apprehend to be singly floating in the Nerves, like Air in a Bladder, but that they are contain'd in a most subtil piercing *Lympha*, as may be perceiv'd by the Wound of any Nerve, which gives occasion to the said *Lympha* to drop out, and is then called a *Gleet* of a Nerve. This Spirituous *Lympha*, that's perfused through the Body of the Kidnies, doth by its most piercing subtil Particles, coagulate the more sulphurous and glutinous Particles from the abounding salin Armoniac, (that are dissolved in the *Serum*) which by having some repugnancy and contrariety against them, it doth, together with the *Serum*, precipitate down the narrow Chanals of the *Parenchyma* of the Kidnies to the Ureters, whence by stimulation, and their own weight, they are moved to the Bladder. That the aforesaid Function is performed *efficienter* by the Animal Spirits, is proved by several Instances of the same Import, viz. some may remember many Years past, I Publish'd a Treatise, Intitl'd the Case of a Nobleman (then) lately deceased, wherein was given an account of a Puncture of a Nerve in the *Plexus Nervorum*, that's near the Groin, occasion'd by the wound of a Sword, that pass'd slant thwart the *Abdomen* down thither, upon which a copious *Gleet* ensued, and soon after, among other direful Symptoms, a suppression

suppression of Urin. This, those Physicians, as Learned and Famous as they were, could impute to no other Cause than the Stone; but they were deceiv'd by their Conjectures, as appear'd plainly afterwards, upon the dissection of the said Nobleman's Body after Decease; his Kidnies, Ureters, and Bladder being found clear of all manner of Obstructions, either by *Mucus*, Gravel, or Stone, though the Kidnies were exceedingly wasted, and shrank into a much lesser Demension, than commonly is found in Men. Upon this fatal Mistake, and consequently wrong Indications, the forementioned six Physicians did very boldly prescribe the most powerful *Diuretics* in very large Doses, and long continued frequent Repetitions; until by chance, one of their Medicines having a Power beyond their Expectation, did give a check to the Gleet, that by derivation had deprived so great a proportion of Nervous *Lympha*, (wherein the Animals do reside) from the Kidneys, as not to leave a sufficient quantity in them, to make separation of the saline Armoniac *Serum* for Urin, which therefore ought rather to be called a suppression of the *Serum* in the Kidnies, than suppression of Urin, and ought not to receive that Name, before its arrival into the Bladder. But what follow'd? The Animal Spirits being return'd to their former Function, and meeting with a great quantity of *Serum*, (that had not been separated during the long interval of suppression) mix'd with the Blood, that was extremely attenuated and fused by the preceding Diuretics, they separated and excerned such a profusious Torrent, as caus'd a most violent *Diabetes*, which by my Prescriptions was removed in a very little time. Furthermore you are to take notice, here was not only an abolition, or at least a diminution of the separation of the *Serum*, or Urin, as it is improperly called, but an *Atrophia*, or defect of Nourishment in the Kidnies, caused through want of the spirituous *Lympha*, or Animal Spirits; so that as I hinted in one of the former Paragraphs, these are the *efficientes* (cause *efficientes*, but in no wise *materialis*.)

of nutrition, separation, and excretion of all the parts of the Body. Add to the former Instances several others of the Gleet, I have before and since observed, occasion'd by the cutting thro' of Nerves in a Wound, and Punctures of Nerves in the Arm upon unskilful Bleedings, which tho' they did not effect so intire a suppression as the Puncture of a Nerve near the Kidnies, yet they have caused an evident diminution of Urin, and an *Aerophia* in that part, into which they were inserted.

Several other suppressions of the *Serum* in the Kidnies I have now and then met with, that were mistaken for suppressions of Urin, occasion'd by the Stone, to the fatal ruin of the Patients, among which I have given an Account of one very remarkable in a Treatise called, *The Art of curing Diseases by Expectation*. I shall here make a short discourse upon the *Aetiology* of the before-cited Disease, wherein the use I make of the *Hypothesis* lately set down touching the *modus agendi* of the Kidnies in the separation and excretion of the *Serum*, will plainly appear. The Patient there mentioned was of a healthful robust Constitution, and fleshy habit of Body, much on Horseback, and scarce at any time long sedentary; his Appetite was much to salt Fish, Pork, Beef, Cheese, and other substantial Food. His Blood upon Phlebotomy in the Arm appeared florid, thick and glutinous, with very little *Serum*. He felt constantly from the beginning of his Illness a weighty pain about his Loins, and pulsatory also; his Urin was Pale, crude, dreggish, and turbid, made at pretty long intervals, and in very small quantities, because the *Serum* was not, neither could it be separated in the Kidnies: For his Blood being engendred out of a thick glutinous Chyle, and this out of gross, glutinous Aliments, must necessarily be resinous, or thick and glutinous, and consequently as impossible and unfit to mix with an obtruse *Serum*, as Rain-water with Therebinthin, unless something be added to the Water to render it piercing, whose sharp Points may divide, cut and insinuate into the Pores of the viscous Resin. Though the Patient did drink great quantities

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quantities of Liquor of one kind or another, the greater part of the *Serum* it produced, was thrown out by insensible perspiration, and very oft by copious Sweats, whilst a small proportion would crowd into the Kidneys, and yield matter for that little Urin that was made. This glutinous, thick and fibrous Blood must be impelled through the Extremities of the emulgent Arteries with great difficulty, and very slow, and with greater difficulty and slowness into the extremity of the emulgent Veins, whereby a fullness and distention must be occasioned, that caused the weighty obtuse and pulsative pain in the Loins, through the defect of a just and sufficient Circulation, which could not but raise great distentions in the hypochonders, unequal pulsations, and other Symptoms, too many to be here discours'd of by retail. From no other Remedies, but such as obtain a power to remove that clammy, stringy Constitution of the Blood, could any benefit be expected; though on the contrary, improper lithontriptic Diureticks were advis'd, impelling the Blood more into the Kidneys, and cramming them, whence the pain increased, and the *Serum* was more damm'd up, until at last the Patient being injudiciously sent to the Bath, those hot acidulous Waters inwardly taken, put a quick period to the whole matter.

Neither is it always a want of salin armoniac *Serum*, or defect of its permixture with the Blood, that are the causes of a suppression or abolition of the separation and excretion in the Kidneys, is evident in an *Ascites*, or Dropsie, where there is salin *Serum* in abundance, and so thorowly mixt, that the Blood is but little thicker than Water, and so little glutinous, that the least drop will scarce stick to any thing; yet notwithstanding very little *Serum* is evacuated by the Kidneys into the Bladder, which redounding therefore so much in the Vessels, is thrown into the Legs (which are then improperly called *pedes œdematosi*) thighs, *scrotum*, or the capacity of the Belly. So that the suppression of Urin, as its commonly termed, is the most frequent cause, and which

which most Physicians do agree unto, of an *Ascites* and *Pedes edematosi*, succeeding a long Ague, Chronical *cachexia*, jaundice, continued debauches of Brandy, or other strong Liquors, and great Hæmorrhages. Though in most sorts of such Dropsies, the most potent of supposed Diureticks are used, and lixivial Remedies, as Lyes of Broom-ashes, and others, taken to excess, yet no more Urin, but rather less is expelled, and the Dropsie increased. In some of these cases, I have known monstrous hydro-pical Swellings reduced by a month or two's drinking of Bath Waters, which, at proper Seasons of the Year, a Course of *Spaw* would have perform'd in less time. The cause of this kind of suppression can only be imputed to the Animal Spirits, or the spirituous *Lympha* being vitiated. But in regard that this subject, together with the examination of its Remedies, that are no less numerous than those against the Stone, would take up too much room, I chose to reserve it to another time.

Among that *farrago*, and mixt heap of Diureticks, and Lithontripticks, there remains I should reduce them to a more choice and select number, such as are chiefly in use, and most celebrated among Physicians, and afterwards give you my slender Opinion upon their *modus agendi*, or manner of Operation.

Diure:
ticks in
use.

The Roots of the most approv'd are the five opening Roots, but more especially *Persly*, *Restharrow*, *black Radish*, and *Horse-radish*; among the Leaves, *White Saxifrage*, and *Burnet Saxifrage*; the chief Seeds, Berries and Fruits, are, *Grumwell-seeds*, *Burdock*, *Broom*, *Daucus*, *Parsly*, *Fennil*, *Anis*, &c. *Winter-cherries*, *Hipps*, and *Juniper-berries*, more particularly *Red Cicers*; In the number of Animals, *Millepedes*, or *Sows*; and among the Stones, Salts, and Minerals, *Ludas*, or the Stone taken out of a Man's Kidneys, or Bladder, *Goats Blood*, and *Goats Urin*; *Lapis Judaicus*; *Cineres leporis combusti*, *vitrumustum*, *sal succini*, *sal prunella*, and *Tartarum vitriolatum*.

The

The principal of the most famed Compositions *The most famed Composition for the Stone* are *Electuarium Lithontribon*, and *Electuarium Justinii*, the description whereof you may read in *Cordus* and *Wecker's* Dispensatories, being a rude and unaccountable empirical hodge-pot of abundance of Carminative Roots and Seeds, some deobstruent Roots, most sort of Spices, some Gums, &c. as ill proportion'd, as may be.

Among the Magistral Compositions, by this following Syrup *Horatius Augenius* affirms to have cur'd Six Hundred of the Stone, which is above Five Hundred Ninety and Nine more, than I do believe.

Rx Rad. Saxifr. Rusc. Eryng. Levist. Onon. Alth. Syrup
Gram. Fæn. Petros. a 3ss. Raphan. sylv. 3ij.
fol. Beton. Pimpin. Alth. Urtic. Puleg. Nasturt.
Calam. Polygon. Min. Pariet. a m. 1. fruct. Al-
kek. No. xx. Sebest. No. xv. cort. rad. Lauri 3iij.
Sem. Ocym. Bardan. Prof. Dauc. Sefel. Mil. Sa-
lis a 3ij. Uvar. pass. liquir, a 3vj. Capil. Ven.
Polytric. a m. 1. Coq. S. A. in Aq. Capil.
ven. ℥x. in duplici vase ad ℥vj. e quibus cum
Sacchar. fin. ℥iiij. & Mell. despum. ℥ij. f. syr.
perfecte coct. & aromat. Cinam. 3j. & Nuch.
Mosch. 3ss. m.

Montagnana recommends the following Electuary to that degree, that he doth avow, there can be no Stone, which by it cannot be broke, and grinded into Sand.

Rx Sem. Apii, Petros. gran. Mill. Sol. Rad. Sa-
xifr. Polii Mont. Aristol. rot. a 3j. Lap. Spong.
Judaic. Lync. a 3ss. Vitri combust. Sang. Hir-
ci præp. a 3iij. liquirit. pulv. 3ss. Oxytel. com-
pos. Sacchar. alb. a ℥ss. Aces. Scillit. 3ss. M.
pro Electuario. *Electuary*

The five Opening Roots, Grass-Roots, Carminative Seeds, with other Roots, Barks and Seeds like them, are suppos'd to contain a subtile hot Spirit,

rit, or subtil moving Particles, which by putting the Animal Spirits upon a quicker Motion, do by attenuating and rarefying the Blood, separate the *Serum* from it, and consequently make Matter for the Urin, which being driven down, acquires them the Name of Diureticks, that can no otherwise deserve the Title of Stone-grinders, than by oft dripping by or upon Stones, may in Length of Time make little Holes into them, and render them brittle.

Millepedes The *Millepedes* containing a subtil acidulous Spirit, are thought not only by precipitating the *Serum* to be very Diuretic, but also by piercing into the Pores of the Stone, whose Figures seeming to be adapted for the reception of those acid pointed Particles of the Sows, become thereby Stone-breakers. But considering their preparation, they are not only thereby deprived of those few subtil acid Spirits, that fly away by drying them in an Oven, or otherwise, which is one way of preparation; or are wholly destroyed in their Substance and Virtue, by the other way of preparing them, which is, by washing them well in Rest-harrow-water, next soaking them thoroughly in *Spanish* Wine, which being poured off, they are to be put into an Earthen Pot or Pipkin, very closely cover'd and stop'd, and then to be dried in an Oven after the Bread is drawn, which if it be not done with a very mild heat, and several times repeated, they will be apt to be stewed, and never fit to be reduced into Powder; others do chuse after washing of them in White-wine, to dissolve them in Spirit of Vitriol, whereby not only the Spirit of Vitriol is obtused and impaired, but the acidulous subtil Spirit of the Sows amortised. This solution is pretended to dissolve the Stone in the quantity of five or six Drops, given in Parsly-water, or such like Vehicle. In my Judgment *Millepedes* need no other preparation, than washing the dirt and slime off them with fair Water, after which they are to be but just broken, or very little bruised in a Stone Mortar, and about the number of two or three hundred put into a Matraiss or Bolt-head, and pouring

ing three pints of White-wine upon them; the Glass Vessel being closely stop'd, they are to stand 24 hours, and the Wine is to be filter'd off, the Remainder is to be dried in an Oven in an open Pipkin, and then reduced to Powder; hereof from Two Scruples to Four may be taken in nine or ten spoonfuls of the impregnated Wine. That this will prove Diuretick to those, that are Nephritick, is oft observ'd, though I have known them taken, being bruised and steeped in Ale, for their ordinary Drink, for a quarter of a Year together by those, that were troubled with running Eyes, dimness of Sight, Bloodshed, and Inflammations of the Eyes, Dropries, Jaundice, Pththicks, and other Distempers, without any abatement of those Diseases, or causing more Urin than ordinary; so that People need not be so scrupulous in their Dose in any other Distemper but that of the Kidnies, whether they, as all other Diuretics, are apt to carry all gross limy Humours, they meet with in their passage. Many will put seven or eight of 'em in a Mortar, bruise them into a mass, and pour a Glass of White-wine upon them, and drink it off without straining. Others hang four or five hundred of them in a Linnen Bag in a Firkin of Ale, and after a Fortnights Infusion, drink the Ale for their ordinary Drink.

From a pretended Observation, that Goats Blood *Goats Blood* will break the hardest of Stones, which is a Diamond, most Physicians prefer it beyond all other Lythontripts, advising it to be taken warm, as it comes out of the Veins: this requires some further preparation according to the Sentiments of Vulgar Authors, which is feeding a young Goat with Parsly, Fennil, Carrot and Parnip Tops, Cabbage Leaves, and the like supposed Diuretics, for three Weeks or a Month about the Spring; though others prefer the Autumn, near the Vintage, at which time a Goat is apt to feed much upon Grapes, if he can come at them, whereby they think his Blood is render'd the more Diuretic, and cutting. Being then killed, they prefer the Blood, that comes out of the Veins,

H

about

about the middle of his Bleeding, before that which flows out first or last. No Blood of any Animal doth sooner coagulate in the Air, and dry into a hard, brittle, and sandy substance. On the contrary, the Blood of a Stag only will not coagulate at all, but continues fluid. *Stags Blood* Now whether the Blood of a Goat being drunk warm, will not so coagulate in the stomach, as to occasion a great weight, pain, and indigestion there, whereas the Blood of a Stag, consisting of more Volatile piercing Salts than any other whatsoever, cannot coagulate, by reason of the said copious Volatile Salts, which at the same time will render it the more Diuretic, and piercing: So that two Drams or more of Stags Blood warm, as it comes out of his Veins, with four or five Ounces of Goats Urin, will make a more potent Medicine, than any of that kind. *Urin* Many in a Fit of the Stone, and the Cholick thence caused, by drinking their own Urin (which is much worse than that of a healthful Young Man) hath suddenly removed both to a wonder, and continuing the use of it Mornings and Evenings for several Days together, have render'd the Stone brittle; but this sort of Urinous Draught is attended with a great inconvenience of taking away the Appetite, and weakning Digestion. Beyond all doubt the Urin of a Fox is stronger, and more piercing than any of the before-mentioned, as feeding chiefly upon Blood and Flesh, which abounds much more with Volatil Armoniac Salts, than most sorts of Herbs.

As for Alcalious Salts, or such as are by Fire render'd lixivial, as the Ashes of several Animals, their Hair and Feathers, also Dungs, and several Chymical Salts of Vegetables and Minerals, operate by an absterfivestimulation, or shrinking or contracting the Vessels, whereby they propel the Humours, and precipitate those that are acid: But all lixivials are experimentally found to abate the Appetite, and extremely disturb the digestion of the Stomach.

The red Cicers (which are no other than red Pease, and little different in substance and taste from Common Gray Pease) that are in so high esteem for moving Urin, perform it no otherwise than by a flatuous Spirit, whereby they distend the Bowels and Vessels, and rarefie the Humours contain'd in them, that are forced forward to gain more room; which is no more than what a Decoction of Tares, and most sorts of Vetches, Pease, Horse Beans, and Cabbage can, and some of them do effect in a more powerful manner.

It is to be further observ'd, that all Diureticks, of what kind soever, must be used with the highest Caution in the Stone, Gravel, or any kind of Suppression of *Scrum*, or Urin, lest by forcing and bringing down gross Humours with them, they cramb and choak up the Passages more than they were; for which Reason they are rarely prescrib'd singly, or in great Doses, and frequent Repetitions, in a Fit of the Stone, Gravel, or Suppression; but either mix'd with those Remedies, that have a Power by their Mucilaginous and Unctuous or Balsamick Particles, to smoothe, relax, widen, and render the Passages slippery; as, Oil of Sweet Almonds and Linceeds; Mallows, Marsh Mallows, Pellitory of the Wall, Bear's-Breech, Violet-Leaves, Borrage and Bugloss; or giving small Doses of the milder sort of them, and seldom, &c. And in a Fit, they chuse to confine themselves only to Mucilaginous and Emollient Medicines; also to Balsamicks, as Therebinthin, *Lucitellus's* Balsam, Balsam of Tolu, of Peru, &c. by Mixture with some other Balsamicks, or gentle Diureticks, made into Bolusses, Electuaries, or Pills, and sometimes Elixiers, and Tinctures; at Intervals advising Clysters, Eniollent and Carminative, and now and then Narcoticks; also Half-Baths, up to the Middle, the whole Baths, besides Bags and Cataplasms.

The Prevention of the Return of Fits consists in gentle proper Purgatives and Laxatives, follow'd by proper Diureticks; Mineral-Waters, whether

wholly Diuretick, as the Sulphurous Waters at the Bath, *Sunning-Hill* near *Windsor*, *Heywood-Hill* near *Totteridge*, *Islington*, *Richmond*, *Astrop*, *Deptford*, *Henden*, and other Waters; or both Purgative and Diuretick, as *Dulwich-Waters*, *Barnet*, *Epsom*, *Chigwell*, *Pancras*, *Atton*, *Pescot-street* at *Windsor*, *Strettham*, &c. operate by Quantity, Weight, and Stimulation, some by Fermentation and Rarefaction, and others by Quantity, Weight, Stimulation, Fermentation, and Rarefaction.

To conclude the whole Matter, I could never yet, among all these fore-mention'd Remedies, find any beyond proper Oleous Balsamick Volatile Elixirs, and Tinctures; and these ought to be framed of Ingredients as various and different, as the Causes of Suppression of Urin, and Generation of the Stone and Gravel in the Kidnies, may be supposed.

C H A P. XII.

Of Madness.

I Must own, that among the whole Catalogue of Diseases, nothing seems more abstruse, and inexplicable, than that Preter-natural Disposition of the Brain, that is attended with a Madness; either without a Fever, as a *Mania*; or with a Fever, as a *Phrenitis*; or any sort of *Delirium*, as a *Paraphrenitis* with, or without a Fever, which doth affect the Brain only secondarily, and per *Deuteropatheian*, as the two former do primarily, and per *Protopatheian*. In all these are *Lasa* the *Imaginatio*, *Sensus Communis*, and *Memoria*. The Manner or *Modus* of their *Lasion* cannot well be understood, without first apprehending the manner, how they are perform'd in their natural State, which is the great Difficulty, that neither all my Reading, nor the Meanness of my Capacity can remove. I am apt to conceive, there is properly called (without any Necessity of terming it Analogous) a Sensitive-Memory, Common Sense, and Imagination in all Animals, in some more, greater, or more exquisite, and of greater Power, than in others. A Dog seeing a piece of Meat held to him, at a greater distance than he can be suppos'd to smell it, the *Idea* or Impression which at another former time the said piece of Meat, or something like it, made upon his Sight or Smell, is an Argument of Memory, or else would no more run at it, than to a Stone, or a Log; the distinction he makes, that it is neither a Stone or Log, or any thing else, but a piece of Meat, signifies he hath common Sense, and many Dogs though they are not hungry, and cannot eat it, they will run at a piece

common
sense in
all animals

Meat, or a Bone, carry it away into some retired place, and there bury it, whither they will repair, to dig it up and eat it upon the return of their Hunger, all which implies evidently, they are endu'd with Memory, common Sense, and Imagination; which appears plainer, when a Dog hath been observ'd sometime to bark, walk about, return to the place he left, and do several other Actions as if he were awake, in his Sleep, caused by Impressions or *Idea's* made in his wakeful time, that move his Animal Spirits when sleeping, the variety of which motion excited by those impressions, imply Imagination, Common Sense and Memory, which is further confirmed by the Madness or *Mania*, Dogs, Hogs, and other Beasts, feeding upon Carrion and corrupted Food, are subject unto, depraving their internal senses, so as to commit Violence upon all Creatures, they formerly were familiar with: And lastly their sensitive Passions, (so termed in distinction to those, that are excited by the intellective or rational Faculty) as Love, Fear, Anger, Hatred, is a sign they do know, and distinguish, which are Acts of the Internal Senses. The Love of a Dog is easily perceiv'd by his Fawning, his Fear is discover'd by the holding a Stick at him, his Anger by biting, and his Hatred, which is a continuatd Anger, by his Aggressing of Cats, Rabbits, Bears, Bulls, &c. And among all Beasts, the exercise of the Internal Senses, and Sensitive Passions is most remarkable in an Elephant, as may be observed in the several wonderful Relations, very credible Authors do make of them. For a little digression, the affinity of the Subject puts me upon this Query, Whether a Maniac or a Madman biting another Man, or a Dog, may not have the same Influence upon the Man, or Dog that's bit, in causing him to go Mad, and occasioning an *Hydrophobia*, as the biting of a Mad Log has upon a Man, a Dog, or a Hog? Though it be probable, that the venomous bite of either is reciprocal, yet I never heard it confirm'd by experiment.

Philosophy and Physick. IIII

Without ascending so high as the Intellectual Faculty, comprizing the Rational Memory, Common Sense and Imagination, I shall for the present endeavour to satisfy my self in the *Modus* of these sensitive or Animal Internal Spirits, by the following Notion. I will suppose, that all external Sensation (of the external Senses) is performed by an Impression, or rather Pressure, made by the sensible external Object upon the Sensory or Organ immediately, and mediately by that, upon the sensitive Nerve, be it Seeing, Hearing, &c. Or it may be conceived thus; Sensation is the Perception of any sensible Object: All Perception is by Contact: All Contact is by corporeal Impression, and Impression by local Motion. Here ariseth an Objection, that it's not likely, that a visible Object at fifty or three-score Leagues distance, as the Peak of *Tenariff*, should reach so far, as by Contact, Impression, and local Motion, to affect the *Tuneca Cornea* or Sight; or that the fixt Stars, which are more remote beyond all Comparison, should reach the Eye, so as to make a corporeal Contact upon it. The Answer contains no difficulty, if you will suppose that no Object is visible by it self, but by the light of *Lumen*, and that *Lumen* is a circular Emission or Emanation of luminous Particles from *Lux* (which in reference to the precited Instances is the Sun) and is extended as far above the Sun probably, as it is to us below it. The Interception of the said luminous Particles by colour'd, figur'd, and quantitative Bodies, and their being by them in the Interception modified and determin'd, do thence reach to our Eyes. And why should not Light be as diffusive, or dispersive a Body as Air, (filling so vast a Region as it doth) being much more subtil than it, as passing through every Pore of it? Light hath Quantity, viz. Longitude, Latitude and Profundity, as much, and as properly, as Air, or any other Body. Being condensed by a thick Convex Glass, it hath Weight or Gravity, as might be experimentally found (were the Glass artificially weighed) no less than Air condensed in a Retort by a

Pump. Light rarefies the Air, which Darkneſs con-
denſeth. The Light, and Colours, which are only
Modifications of the Light, (for without Light, all
things are dark, and of no Colour,) make a Preſſure
upon the external Tunick of the Eye, (conſiſting
chiefly of the Filaments of the Optick Nerve, whence
it is this Membrane or Tunick becomes the moſt ſen-
ſible of any in the whole Body, ſcarce enduring the
ſofter Touch of any external thing without an ex-
quiſite Pain,) which is very perceptible to thoſe, that
look againſt the Light of the Sun; this being con-
tinuated to the Optick Nerve, and thence to its be-
ginning, is what I underſtand by Sight.

But here an Objection may be offer'd; *Quicquid
recipitur, recipitur ad modum Recipientis.* The Senſi-
tive Nerves, as the Optick, Auditory, &c. being all
of one Compoſure, Conſtitution, or Temperament,
and the Spirits that actuate them, being all the ſame,
muſt receive the Impreſſion of ſenſible Objects all
alike, and after the ſame manner; and conſequently
Light muſt be taſted, or a Sound muſt be ſeen, &c.
which is falſe.

To this I give in Answer, That all Senſation is
by Contact, that is, by a real or material Action,
and not by immaterial *Species*, or Emiſſion of Ani-
mal Spirits, which are vain Expreſſions. The ſaid
Contact is the ſame, and made in the ſame manner;
but the Poſitions and Figures which it makes upon
the Nerves, and its minute fibrillous Parts, are dif-
ferent as much as the Figures upon a piece of Dough,
(which is the ſame in compariſon throughout all its
Parts,) made by ſeveral Stamps: ſo that the Figures
made by a viſible Object upon the Pores of the Op-
tick Nerves, and upon the Spirits included in them,
are different from thoſe that are made upon the
Nerves of other Senſes by other Senſibles. 2. That
the Senſitive Nerves do differ each from the other in
Softneſs, Bigneſs, Density, and other Qualifications.
3. That the immediate Senſation is not in the Nerves
themſelves, and the Animal Spirits contain'd in them,
but in their inviſible minuteſt Terminations, or
ſubtileſt

subtilest *Fibrille*; and therefore I assert, that the Sight is in the *Tunica Cornea*, the Hearing in the *Tympanum* or Drum, as much as the Sense of Feeling is in the external *Scutis*: For supposing that the *Tunica Cornea*, and indeed all the Tunicks of the Eye, are Expansions of Nerves, and compos'd of innumerable most minute Chanals, that communicate with the Pores, wherewith all the Humours of the Eye are previous, and all filled with Animal Spirits; the Positions they are put into, and Figures that are impress'd upon them, are continuat'd to the Optick Nerve, and thence to its Beginning in the Brain. I will not here undertake the Task of an Oculist, in explaining the Concentration of the Optick Spirits about the Pupil, and the several Changes of Figures they undergo by Reflections in the Humours of the Eye, but pass over to the Hearing, the Seat whereof (as asserted before, I take to be in the Drum, and the Terminations of Fibres of the Auditory Nerve in it, upon which Pressure being made by the Air containing the Sound, and continu'd to the Beginning of the Auditory Nerve, is the Cause of Hearing. Wherefore I can in no manner be perswaded, that the Sound made upon the Drum, beating the Hammer (*Malleus*) against the *Incus* (Anvil,) and propagating the Sound to the internal Air contain'd in the long crook'd Passage beyond it, is by the Means thereof carry'd to the Auditory Nerve; the Use of the said Internal Air being rather to keep the Drum stretch'd, (as a Bladder is kept distended by the Air that is blown into it, and magnifie the Sound by the Hollow, containing nothing but Air, as you may observe in a Military Drum, the Hollownes whereof doth exceedingly magnifie the Sound that is made upon it by any sort of Percussion. That these little Bones placed in the Hollow of the Air, are so instrumental to Hearing, I cannot well understand, but do rather conceive their Use to be for a Stabiliment or Fulciment of the Hollow, and keeping the Drum, and the Circumvestient Membrane of the said Hollow distended.

Hence

Sight
Feeling

Seat of
Hearing

Deafness

Hence it is, that the Drum of the Ear being by moist Weather, or damp Southerly and South-West Winds somewhat relax'd, the Hearing is dull'd, and not so sharp as in clear dry Weather, when the Wind gently blows Easterly, or North-East. Moreover, when the Drum hath been extreamly stretch'd by a near violent Noise, Thunder or great Gun, so as it cannot return to its due Streightness, but must fall into a wrinkl'd Skin, the Hearing is either wholly lost and destroy'd, as it hath happen'd to several having a thin dry weak Drum, upon a near and extream sharp Sound; or is so obtus'd, that they can hear but very indistinctly. The like Accident may

Blindness

happen to the Sight, when any very Luminous Body makes too long and too near an Impression upon the Tunica Cornea, whereby being too much thinn'd, and distended, it doth cause a Blindness; to prevent which, Nature hath framed the said Horny Coat thicker and stronger, than any of the inferior Tunicks of the Eye, the use whereof (namely the Tunicks) I take chiefly to contain the several Humours, which reflect or turn back the visible Object, or Pressure made by it, to the Tunica Cornea, as the Quick-Silver on the back-side of the Looking-Glass stops, or returns the Object to the Surface of the Glass.

The most excellent of the External Senses is the Sight: Its Organ, that wonderful Machine of the Eye, consists of a greater Number of fine smooth polish'd Parts, than any of the other Senses, and is more in Use and Exercise than all of them together; for a Man that is awake is always seeing, and is commonly accounted awake, because we observe his Eyes are open; so that necessarily a far greater Proportion of Animal Spirits, and the finest and subtlest of them, is consum'd by Seeing, than by all the other Senses conjunctly; whence it is, that Sleep being destined for the repair of the Animal Spirits, we always perceive the necessity of it approaching first in our Eyes, which makes People commonly say, they are so sleepy, they cannot keep their Eyes open; and therefore

Sleep

therefore we do as commonly conclude a Man to be
 In sleep, because his Eyes continue shut. It is no *why?*
 wonder then, if blind Men can obtain longer from *Blind Men*
 sleep than others, or that their other Senses are much *can abstain*
 more exquisite, than those that can see; because that *longer from*
 great flood of the finest Animal Spirits which the *Sleep than*
 Sight doth require, is distributed to the other *others.*
 external Sensories. Their internal Senses are also
 much stronger, in regard many blind Men have been
 observed to have stupendous Memories, and won-
 derful Phantasies: Thence it is likewise, that when
 a Man hath a desire to call any thing to mind, which
 he had almost forgotten, or to think very seriously
 upon a Subject, he is apt either to shut his Eyes, or
 look down to the Ground, whereby a Proportion of
 the Optick Spirits are kept in the Brain, to assist the
 Internal Senses. Moreover, because so vast a supply
of Animal Spirits is requir'd, to be transmitted to the
 Eyes for Sight, Nature hath fram'd the Optick Nerves
 bigger, than any in all the Body, being the only
 Nerves that have a perceptible Hollownes in them,
 and thereby render'd capable to give Passage to such
 great Floods of Spirits; not only to supply for that
 long continuance of Seeing, but also to supply that
 variety of Parts, which is greater than those, the
 Organs of Hearing, Smelling and Tasting do consist
 of. I expressed, that commonly a Man seeth, or useth
 his Sense of Seeing, as long as he is awake, by rea-
 son of the constant readines of visible Objects, that
 will crowd in upon the Sight; he doth not in like
 manner always hear, or his Hearing is not always in
 exercise, though he can always hear, by reason there
 is not always a Sound or Noise in Being, to crowd
 in upon him. And though it is possible for a Man
 to consume or spend abundance of Animal Spirits,
 by hearing a continual Noise from Morning to Night,
 so as thereby to make him sleepy, yet it seldom doth
 happen, because Nature can better endure the waste
 of Auditory Spirits, which are incomparatively grof-
 ser than the Optick, the loss and wasting whereof
 being

being much greater, and a greater abundance being required for the Sense of Seeing is the Cause, why we always perceive the necessity of Sleep in our Eyes, before any of the other Senses, in which also the like necessity is perceptible, in regard, that when a Man grows sleepy, he doth not care to hear, or use any of his other Senses. And though by much stirring or local Motion, and other Labours, the wasting of the Animal Spirits in the Joints, doth occasion Sleep, yet its always first perceiv'd by weight or drowsiness of the Eyes, because they are deprived of their due Proportion of Animal Spirits, that were transmitted to the Limbs, and wasted by their continued Exercise.

Before I recede from this Subject, it's convenient I should explain what I mean by describing all Membranes to be Expansions of the Extremities of Vessels, in order to make it appear, that the Seat of all the External Senses is in the Membranes, and not in the Nerves. That the *Scutis* or ambient Skin of all Animals is a Membrane, cannot be doubted, when it's look'd upon, after it's dress'd by the Tanner or Fellmonger into Leather. That it consists of the Expansion of the Extremities of all the Vessels, as of Nerves, Arteries, Veins and Lymphæducts, is evident by it exquisite Sense of Feeling, and by the least superficial Hurt of a Scratch, causing small owlings of Blood, and by Sweat, the Extremities of the Nerves importing Feeling, as the Extremities of the other Vessels lets out Blood and Sweat. By Expansion, I do not understand a flat spreading out of the ends of the Vessels, as if it were Dough expanded by a Rowling pin, but I do apprehend the said Vessels toward their Terminations, to be divided into thousands of small Filaments, and glewed together in the *Cutis*, by a glutinous substance, (engendred out of the Humours, brought thither by the aforesaid Vessels) that is not so stringy or fibrous, as to be called Flesh. It is scarce denied by any of the Learned, that the Ambient Skin is the chief Seat of Feeling; for though other

Sleep
occasion
of it.

other Membranes, (as also Nerves and Nervous Parts) as the *Periostium*, the Internal Membrane of the Kidnies, and most of all the *Tunica Cornea*, and next to that the Drum of the Ear, are of a much more exquisite Sense, than the Skin, as consisting of a far greater Proportion of Nervous Expansions, and consequently too tender, and therefore not so proper to distinguish all sorts of Touches or Impressions, as hard, soft, rough, smooth, hot, cold, &c. which Impressions are thence continuatd, by the nervous Filaments to the Bodies of the Nerves, and at the same Instant to the beginning of them, and thence to the Common Sense, which doth distinguish these Touches or Tacts into specifications of hard, smooth, &c. And here by the way, it may be observ'd from the Instance of some Paralytics, who have lost the Sense of Feeling in some of their Joints or Members, tho' their Mobility or Motion remains intire, that for the most part those Nerves, that proceed from the Brain, bring the Sense of Feeling, and those from the *Medulla Spinalis* are causes of local Motion, which is an Argument, that the Spirits that flow immediately from the Brain, are much more subtil, than those that are deriv'd from the Marrow of the Back-Bone.

What I say here, is not to be understood so generally and absolutely, which made me only intimate, that for the most part, and not all, the Nerves immediately proceeding from the Brain, do only bring Sense; for some of them do also convey Motion, but withal a Motion so agil, nimble and durable, or frequently repetible, beyond what any of the Spinal Nerves do or can perform, as appears in the nimble, and frequently repetible Motion of the Eye and Eyes-lids, of the Tongue, &c. Neither do I exclude the Spinal Nerves, from transmitting Sense and Motion together; but am to be understood, that these fine Spinal Branches of Nerves, and consequently containing Spirits more subtil, that are disseminated through the *Cutis*, being the Seat of the *Tact*, do communicate the Sense of Feeling, and the other that

are

are more gross, and dispersed through the Bodies of Muscles, cause Motion.

That the Sense of Feeling is more exquisite at the ends of the Fingers and Toes, proceeds from the greater concourse of fine capillar Nervous Terminations in those extream Parts.

The spongy Membrane of the Tongue, which appears to be an expanded Contexture, out of the Filaments of the gustative Nerves, and of the Extremities of the Coats of Arteries, Veins, Salival and Lymphæducts, is likewise found to be the Seat of the Taste, especially about the Tip, where there is a greater concourse of Nervous Filaments.

In like manner, I do conceive the Drum of the Ear to be a thin subtil Membrane, compos'd of the Filaments of the Auditory Nerve, and the Extremities of other Vessels, that are inserted into it. The sound that from without makes its Pressure upon the Drum, being enlarged by the Hollow of the Tortuous narrow Passage, is carried by those Filaments to the Trunc of the said Nerve, and thence continued to the beginning of it, and to the Common Sense: So that the sound to me doth not appear, to be carried down to the further end of the said tortuous Passage, and thence to the Auditory Nerve, no more than the Pressure of a luminous Object upon the Horny-Coat, is continued to the Chrystalline and Vitreous Humour at the bottom of the Eye, to be thence communicated to the Optick Nerve, with which it doth not seem to have any immediate Communication; for as I said before, the Humours of the Eye wrap'd up by the several Coats to keep them together from dropping asunder, seem to me only intended, to modify and reflect the Object back again to the Horny Tunick, whose Contexture is chiefly of the numerous Filaments of the Optick Nerve. The *Tunica Cornea* to be aptly disposed to receive the Pressure of visible Objects, must be kept up distended by the watery Humour (*humor aqueus*) under it, which if it be any thing lessened, either by evaporation

evaporation in a hot Season, or by a Fever, so as to shrink or relax into the said Tunic, little wrinkles, the Sight immediately grows dim upon it; and if it wholly runs out by a Wound, so as the Tunic happens to fall into greater wrinkles, then the Sight is wholly lost. In old Men the Sight becomes dim, and so it doth oft upon a continual Fever, by reason that by length of Time, or Age, and by Exiccation, the *humor aqueus* is somewhat diminish'd, and the Tunic thereby is somewhat relaxed or slackned, which makes it seem thicker, and consequently not adapted to receive so vigorous an Impression.

It may likewise be observed, and is now generally so received, that the Seat of Smelling is not in the Olfactory Nerves (I do not mean those that are commonly so call'd by the Antients, that had mammillar terminations,) *Processus mammillares* which are now taken to be rather carriers off of some Excrements of the Brain) but in the internal Membrane of the Nostriis, through which the Olfactory Nerves are expanded in Filaments.

Since then it appears, that Nature having plac'd the Seat of all the other external Senses in external Membranes, as parts to which the External sensible Objects do first arrive, and make their first and most sensible Impression; it is a persuasive Argument to me, that the Seat of the Sight is in the *Tunica Cornea*, or *Sclerotica*, being the most sensible, and consequently chiefly consisting of Expansions of the Optic Nerve, whereas the *Tunica Uvea*, or *Choroidea*, consists more of a contexture of Terminations of other Vessels. It will not be impertinent here to offer a few seeming Reasons out of a great many, that induce me to suppose the *Cornea* the Principal Seat of Vision, without excluding the necessary concurrence of every Tunic and Humor of the Eye, a great Fault in any of them being as capable to occasion an abolition, diminution, or depravation of Sight, as the least considerable Wheel in a Watch being

The Seat
of y^e Sight

being disorder'd, may cause it to stand, move too slow, or too fast.

I have before asserted, that all Sense is by immediate Contact of any corporeal sensible Object. The Touch, Smelling, and Taste are by sensible Contact, their Objects consisting of grosser Particles; but Seeing and Hearing are, as it were by a double Contact, that is, by reflection, because their Objects are more subtil, and without a due reflection, could not be perceived by the Eye or Ear; for by Reflection the sensible Object is much strengthened, and consequently obtains a greater force to move the Sensorie. The sound made upon the uppermost Skin of the Drum, would not be so strong, or make such a sort of a sound, were it not reflected by the undermost Skin. Wherefore Light, or any luminous Object, being a Body the most subtil of all others, must necessarily require a due Reflection, before it's powerful enough to move the Sight. It's allow'd by most, that Light passeth in Rays, that is in Lines of continuatd luminous Particles through the Cornea, and Humor Aqueus, to the Foramen Uvea, where being contracted, or gathered closer, they make a conical Figure.

The Crystallin being the most Diaphanous, Compact, thick, and fullest of Pores, is capable to be crowded with a great quantity of luminous Rays (not unlike thick Grass, which by condensing the Rays doth magnifie the Light) that are reflected or turned back by the Humor Vitreus, which in colour and capacity of receiving luminous Beams, through want of sutable Pores, may aptly be resembl'd to Quicksilver behind a Looking-Glass, reflecting luminous Objects. That those Rays are reflected by the Humor Vitreus is seemingly at least proved to me, by the seeing of those false Appearances of Flyes and Motes in a Suffusion, which appear to the Sight to be floating in the Air before the Eye, or Tunica Cornea: For supposing that the Light carried those little Flyes or Bowls directly

ly down to the *Crystalline*, and thence to the *Vitreus*, *Retina*, and Optic Nerve, how can they appear floating in the Air, or on the outside of the *Cornea*, unless they are reflected back again from the *Vitreus* to the *Cornea*, to make their Impressions there? All Refractions, which in the Opticks are vulgarly imputed to a *duplex medium* of different Natures, are double, or broken Reflections, as appears in a Stick, that's partly in the Water, and partly in the Air; so that a Refraction not being possible without Reflection, it follows, that where a Man seeth every thing double, by reason of the removal of the *Crystalline Humour* out of its place by a fall, a blow, or other violence, the visible Objects are refracted, by a part of the *Crystalline* that retains its place still, and partly by that which is in that part, whence the *Crystalline* was removed.

To shew, how these sensible Impressions are at the same instance carried to that part of the Brain, where the Internal Senses are seated, is my chief Design; and In Reference to that, I have been the more particular in explaining the external Senses, and the *Modus Sensationis*. I do conceive then, that the Nerves do consist chiefly of congregated Filaments, drawn into length, besides others that are lateral, and that the beginning of the Nerves are Filaments of the medullar part of the Brain, (whereof its only supposed it doth consist) congregated and gathered together into one united body, which by being afterwards divided into so many lesser congregated Bodies, doth constitute each of the beginning of the said Nerves. Wherefore I do apprehend, that an impression made upon any of the sensories that consist of Nervous Filaments, the impression by continuation (in the manner formerly mention'd in the Instance of a Cord) is carried to the beginning of the Nerves, and thence to the united body of the Filaments of the *Medulla Cerebri*, where one Object is distinguish'd from another, which I term *communis sensorio*, or *sensus communis*. I will

likewise suppose, that besides those prolonged Filaments, the Nerves are filled with innumerable lateral ones, of several figures, and minute dimensions, the various positions of which being actuated by Animal Spirits into several representations, impressions and figures, if permitted to remain so, is Memory, and when compar'd, and variously composed, one to another is Imagination. So that I do conceive Memory to be the *basis*, and antecedent to Imagination, as common Sense is of Memory, all which I cannot apprehend to be other than various Acts of the *Cognitive*, or *Sensitive* faculty. I do very well know, that applying the same Assertion to Rational Memory, and affirming that Memory is the *basis*, and antecedent Cause of Rational Imagination, admits of a considerable Objection, *viz.* That very oft Persons of the weakest Memory have the strongest Imagination, and the best Judgment, and that the Memory may be lost, though the Imagination and Judgment solely depending upon that, continue entire; which I do deny, for as much of the Memory of things as is lost, so much of the Imagination must be lost; for supposing that you have intirely forgotten the *Idea* of a Horse, Cow, or Dog, you can never frame any Phantasie or Imagination of them; so likewise if your Common Sense is so far abolished, that you cannot conceive or make a distinction of the impressions those Animals made upon the Filaments of your Brain, it is not possible for you to remember them. Probably then this Inference may be made, that the greater Memory a Man hath, the greater must be his Phantasie, Knowledge, Wit and Judgment; which is otherwise observed, in regard that very oft the greatest Memories are not attended with the greatest Wit and Judgment. That they are attended with the greater Knowledge is most certain; for a Man that remembers a great many Objects, or Subjects, must know so many more than another, who doth not remember so many; though for what

Philosophy and Physick.

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concerns his Phantasie, Wit and Judgment, they may be quicker, or nimbler, and more agreeable to right Reason in one of the weaker Memory, but no farther, and of no more Subjects than the number he remembers.

It may be objected against what I asserted before, that Common Sense, Memory and Imagination, are only three several Acts of one Faculty, viz. that Mad-men oft retaining their Common Sense and Memory intire, and having only their Imagination depraved, is an evidence they must be three distinct Faculties, whereof one being depraved, doth perform depraved Acts, and the others that are intire, do perform Acts as they ought; wherefore since a sound Act, and one that's depraved, cannot proceed at the same time from one and the same Faculty, it follows, they must be three distinct Faculties. I do Answer to this, that the Common Sense and Memory in a Mad-man are depraved, to the same proportion his Imagination is depraved; for to him a Horse may appear to be a Cow, or he may and doth remember things to be otherwise than they were first represented to him. The same Animal Spirits, the same Nerves, and medullar Filaments of the Brain, do all act in the exercise of the internal Senses: And that perceiving of sensible Objects (which is the act of Common Sense) the retaining them, (being the Act of Memory) and the compoling them variouly together (which is the Act of Phantasie) should be other than Acts of the same Sensitive or Cognoscitive Faculty in Beasts, or of the Rational Faculty in Men, I can in no wise apprehend.

In regard the Memory of Beasts (though some of them have a Brain of greater dimensions than a Man) is so little capable of retaining many sensible Impressions, which are certainly material; and whereas a Man is capable of retaining of innumerable and infinite impressions of Words, Languages, and all things sensible and intelligible, it cannot be concei-

The Soul
Imaginative
al.

ved, but that the Rational Faculty, and consequently the Soul must be immaterial; for should you suppose, as commonly its taught, that the Memory is only an Impression made upon, and retained either by the soft substance of the Brain, or upon its Animal Spirits gathered into a soft Cloud; were the Brain of as large an extent as a Church, and could harbour as many Spirits, that, nor these could be capacious enough to retain a tenth part of things, which a Man is capable of remembring. So that I say, the Rational Faculty must be immaterial, that is, cannot be performed by a material Organ, as the Brain, and its material Animal Spirits; and therefore its impossible for any Man to conceive the manner of Operation of the Rational Faculty, as long as the Soul continues confin'd and immersed in a material or corporeal substance: And were the Soul of Man material, as some do believe for want of true Reason, it could be capable of discerning and remembring no more Objects, than the Soul of a Beast, the Brain of some Beasts being as organically and aptly framed, as the Brain of a Man, and in some the Animal Spirits much more fine and subtil.

From this Discourse I do infer, that the Cognoscitive internal Senses, (which are subservient to the Rational Faculty, comprehending a Rational or Intellective Common Sense, Memory, and Imagination) in a *Mania* are only affected; for the Intellective being immaterial, can in no wise be subject to be affected by any thing that is material; neither could any material Remedy have a power to act upon an immaterial Disease of a Man, as Madness must be termed, were the Intellective part touched, more than upon the immaterial Madness of a Devil.

Madness
This premis'd, I am of opinion, that the Animal Spirits in the Brain being irregularly and violently mov'd, is the cause of a *Mania*, by putting those sensible Impressions, that are made upon the lateral minute Filaments of the Brain, into a disorder, and changing their Positions, which occasions the Common

mon Sense, Memory, and Phantasie to be so deprav'd: That the Fury and Heat, which Maniacs are so frequently impell'd into, are occasion'd by the continuat, quick, and impetuous Motion of the Animal Spirits, which thereby are grinded into very sharp cutting, piercing Points, that disunite the lateral Filaments, stimulate, prick, cut, and pierce those Filaments of the medullar part of the Brain, and of the Nerves, and by the foresaid rapid Motions, the whole sensitive Machine is put into a Flame: That their continual wakefulness proceeds from the abundance of Animal Spirits (the cause of which shall be explained below) the Brain of Maniacs is furnish'd with the vast of Spirits, their paucity, Feebleness and slow motion, giving commonly occasion for Sleep. That they are in no wise subject to Fevers, taking Cold, Obstructions of any of their Bowels, or scarce any other Distemper, or any preternatural Symptom, except over-wakefulness (*vigilia immoderate*) is to be imputed to the Rapid Motion of their Animal Spirits, attenuating their Blood, promoting of its circulation, rendring the Body pervious, and free from all Obstructions of the internal and external Pores; their Blood being more salin and dry, than sulphurous, is not so much expos'd to a febril Putrefaction: Though it must be observ'd, that very oft before Maniacs fall into their Distemper, there is a great Calm and slowness of Motion in the Animal Spirits, which occasioneth a very slow motion in the Humours about the Bowels, and very oft a Stagnation, that disposes them to a particular sort of putrefaction, whence gradually proceeding some putrid, salin, sharp, acuated or pointed Particles, that oppress the Animal Spirits, dull their Motion, and cause such a disorder in their Blood, that is productive of such Symptoms, which commonly Melancholic Hypochondriacs are troubled with, as Sighing, heavy, sorrowful and desponding Thoughts, palpitations of the Heart, Frights, Fears, Sloathful-

ness in stirring, Languidness, &c. These forementioned putrid, saline Particles, as they arise, and separate gradually, and are afterwards mix'd with the whole Mass of Blood, increase the prenumera-
ted Symptoms, until at length great Crowds issuing thence, do so violently move, stimulate, impel, and hurry the Animal Spirits into a Tempest and Fury, whence soon after those other Maniacal Symptoms do follow.

A *Mania*, or Madness, though it be only a Symptom, and the chief and most urgent of the others, that are associated with it, is as all other chief Symptoms, commonly called a Disease, by a *Metonymia Adjuncti pro subjecto*. By the same tropical manner of speaking a Fever, or rather Fervor, is called a Disease, from the burning heat that doth oft accompany it, though it be but a chief Symptom. This I thought fit to observe, to prevent your judging it a mistake in me, in calling a *Mania*, and many, if not all chief Symptoms a Disease, which is a very common way of speaking among most Physicians.

digestion
That in Maniacs the functions of the Bowels, and other parts are performed with greater vigour than in others, appears by their digesting almost any thing that's edible, by their copious Excretions by Stool, Urin, and Sweat, by their wonderful and almost incredible strength of their Limbs, so as sometimes the strength of a Madman, shall exceed the united force of four or five Men, that have their Senses intire. Their Hearing, Seeing, and other Senses are much more exquisite (though depraved) than in others, in regard Madmen will hear the least Noise, and see the least Object, beyond what they could do when they were *Compos*. The Cause and Reason of all which is the abundance of Animal Spirits, that are contained and engendred in Madmen, insomuch that it may be presumed, the greatest part of their Blood is spiritualiz'd, or converted into Animal Spirits; for
without

*Hearing
Seeing
&c.*

without supposing this vast plethory of Spirits, it's impossible they should be always, Night and Day, using their Tongues and Limbs in so furious and violent a manner, without any long intermissions of Rest or Sleep. This Plethory ariseth from the almost perpetual, violent, quick and nimble motion of the Animal Spirits, piercing, grinding, and subtilizing the greatest part of the Blood into Spirits similar to themselves.

If a Madman, after he hath continued in a long raving Fury, falls into a long intermission of Silence, hardly to be provoked out of it, that must be adscribed to the great expence and waste of Animal Spirits, by his long fit of Fury, which he is forced to repair, by giving the remainder of his Spirits time to breed more.

His reciprocal seasons of Madness, intermix'd with intervals of Rational Discourse, in some for a longer time, in others shorter, may be attributed to the variety of motion in his Spirits, which sometimes moving regularly and naturally, are the occasion of the latter, to wit, his lucid Interval, whereas he is impell'd into the former by Fits, as frequent, as there is a new falling out of a crowd of the fore-mentioned putrid saline Particles, mixing with the Blood, and upon its arrival to the Brain, mixing with the Spirits.

I have been obliged to make an expatiation in the Theory of the external Senses, to the end I might more easily explain the manner of natural Operation of the Internal, thereby in some sort to apprehend the manner of their preternatural Operation in a *Mania*; which I did the rather, that I might give my self the occasion of examining the practic part, relating to the curing of Diseases of the Eyes and Ears, as well as of the Brain. If I have not been so successful in these most difficult and abstruse Matters, as I could wish, or as others of a much better capacity might have been, I hope I may be excused for my attempt, were it only for

proposing the Subjects, and giving others an opportunity to exercise their Industry and great Abilities. However, I shall presume to give you an Account of what use I make of the said Theory.

Eyes
the cause
of their
Dimness

First, In relation to the Eyes, the *lesion* of the Sight is either caused by the fault of the Optic Nerves, and their expanded Filaments, the decay, waste, and vitious constitution of the Animal Spirits, or the vitious disposition of the Tunics of the Eye, but especially of the Horny-coat, or by the fault of the Humours. I mean the aqueous, vitreous, and crystalline, whose Office I did only suppose is, to support and keep the Tunics justly distended, and by Reflexion, to return the visible Impression to the Horny-coat.

I do only pretend here to take notice of some defects of the Horny-coat, the Humor aqueus, and Optic Nerves; for should I here insert, what may be practically observed, concerning all or most Diseases that are incident to the Eyes, and their several Coats, Humours, Muscles, and Optic Nerves, a large Volume would be scarce capacious enough to contain it.

The forementioned Tunic being of too thin a texture (from the tenuity of the Nervous Expansion) and the extreme subtility of the Optic Spirits, and the tenuity of the Aqueous Humour making too little resistance to the luminous Particles, coming from a great distance; the said luminous Particles being too much thinned, and losing some part of their Lustre, and thereby not congregated enough, by reason of the rarity of the fore-said Tunic and Humour, and consequently have too little force to act upon them; whereas in a Tunick, that is of a more compact texture, and consisting of more numerous, though much straighter Pores, the luminous Rays are much easier gather'd together, and consequently may operate from a greater distance. This laxity of the said Tunic and Humour is two-fold;

one

one natural, and the other adventitious, by reason of some Disease, as a Fever, Consumption, &c. The former is in no ways to be meddled with. The latter either ceaseth upon the removal of the Disease, that caused it, or if it should continue, may be remedied by washing the Eyes daily with Water, wherein a very little Saltpetre, or rather *Sal Prunelle* hath been dissolved; or you may two or three times in a Day drop into the Eye, a Drop or two of this Solution, viz. two Grains of white Vitriol dissolv'd in two Ounces of some clear Well-Water; wherefore you are to take notice, that most common Eye-Waters, that are cry'd up for sovereign Remedies against all, or most Diseases of the Eyes, are strictly to be avoided in all short Sights, whereby they would be rendred much worie. Such sort of Waters are usually distilled from Fennel, Celandine, Eye-bright, Rue, Vervain, Male Pimpernel, Hogs-Fennil, &c. Besides, in short Sights the Distention of the *Horny Tunic* is too weak and slack, by reason of the loose Texture, and thinness of the said Tunic and Aqueous Humour, upon which the feeble and almost spent Rays, that arrive from a great distance, can scarce act or exercise such an Impression or Motion, as is necessary for Sght. On the other hand, where the said Tunic is of a good Texture, and fully distended, Objects are petceivable from a much remoter distance. But where the forementioned Tunic is grown too thick, and consequently less diaphanous, and less porous, that Sight is neither good at a distance, nor near, as it's oft observ'd in old Folke. Moreover, in those the *Humor Aqueus* is very much thickned, so as to deny a full and free Passage to the luminous Beams; the said Humour is also become less turgid, and of small compass, whereby the *Horny Tunic* becomes less distended, and a little flatted, so that the visible Object must necessarily act very feeibly upon it, the Rays not being sufficiently congregated, through its defect in Convexity. Add hereunto, that in them the Optick Spirits are grown few, gross, and

Eye Water

n.B!

v. H. Apo: 164.

Horny Tunic

Old Folke

- x Diaphanous. Transparent.
- x Congregated. gather'd together.

*Rules
To preserve
the Sight
By*

famous, which renders the Perception of the Object dim and cloudy.

To preserve the Eye-sight, is to retard, and hinder it from becoming such, as it is in old People; that is, 1. By rendering the Animal Spirits light, subtil, clear, and more copious. 2. By attenuating the *Horny Tunic*, and the watery Humour. 3. By avoiding straining of the Sight, by exercising it long and often upon very small, shining, dispersing, or very distant and remote Objects.

The first of these means consists in keeping the Body clean of gross Excrements, which gave so frequent Occasion to the Ancient Physicians, to invent Pills peculiarly appropriated to the Sight, and distinguished with Names referring to it; As *Pil. Lucis majores* and *minores*; and others, as *Pil. Aurea, sine quibus*, *Cochia majores* and *minores*, &c. I cannot think any of these Compositions hath any more regard to the Eyes than to the Toes; but because in the Mass of *Pil. Lucis maj.* and *min.* is contained a very small proportion of *Eye-Bright*, mix'd with Aloes and *Colocynthis*, together with a great many contrary Ingredients, which serve for nothing else, but to clog the Medicine, and all this is to be made into a Paste, with Juice of Fennil, they thought they had reason enough to expect, from them and the others fore-mentioned, all the Virtues, whereby to preserve Sight, and to cure the Eyes of all Diseases past, present, and to come; but what is a greater wonder to me is, that still there are many Physicians, that allow a very great respect to the said Pills in Diseases of the Eyes, whereas most certainly a good *Extractum Rudit*, or *Catholicon* well compos'd, and made up, will serve abundantly better, cheaper, pleasanter, and more effectually in any Disease, that may require strong Purging; so that were all those *Colocynth* and *Scammoniack* Compositions, which modern Dispensatories are cram'd with, thrown out, it would be much more profitable to the Patient, and less troublesome to the Apothecary.

What

I should apprehend it a mistake in my self, should I pretend to render a purgative Medicine specifick, or appropriated to any particular Disease, or Part affected, by adding to it a specifick Alterative, expecting by that to lead the Purgative to the diseased Part, and to virtuate it by that to purge, or draw only; or chiefly from that Part, particularly the Humour, or Cause, that doth effect it with a Disease; as in case of a Disease in the Eyes, for the Reason aforesaid, Physicians seldom omit to mix *Eye-Bright* with their Purgatives, in Imitation of the forementioned *Pil. Lucis majores*, and *minores*; or in case of a Palsie, Convulsions, Apoplexy, or any other general Disease of the Head or Brain, to add *Castor* to some strong Cathartick, and the like almost in all other Cases. All Purgatives ought to be reduced to the least Quantity, to render it more acceptable and easy to be taken by the Patient. 2. The Purgative by being mixt with a specifick Alterative, doth wholly drown and destroy its Virtues, as much or more than the Purgative is infringed and abated in the Operation by it.

What I mean by keeping the Body clean, is to take now and then those Pills, which are recommended in the foregoing part of this Treatise, without adding the least grain of Eye-bright to them. Besides this, it's necessary to abstain from all gross, windy, steaming Meats, salt Filth and Flesh, sour Sauces, strong Drinks, feeding chiefly upon Meat of a good Juice, and that yields but little Excrement, and using Drink that's clear, well digested, and moderate in strength. Nothing hitherto hath been observed a greater Enemy to Sight, than Wormwood, which being used in Drink, or otherwise, hath been the occasion of dulling the Sight in some, and of Blindness in others; yet notwithstanding, *Dioscorides* commends it for a sharpner of the Sight, and therefore little Credit ought to be given to these old Authors in many of their Characters. Onions, Leeks and Garlick, come not much short of that Plant. All

raw

raw Salads are experienc'd hurtful to the Sight, by contributing Matter for Crudities, and being windy. Weeping in Women, a long, sorrowful and melancholic Disposition, and too much Gravity do lessen, condense, and blunt the Optick Spirits, which ought to be serene and agil. Living in a dark House in a foggy Air, works Effects little different from the former. Too much Sun-shine reflected from a sandy Ground, hath been the Cause of Blindness in many that live in Spain. Very Hot Countries contain more Blind, than those that are temperate, or cold, though in the latter they are not commonly quick or far sighted, excess of Cold condensing the Optick Spirits too much. As weeping and great Debauchees do oft furnish their Eyes with an outward glazie Coat, so they do not seldom according to the common Phrase, drink their Eyes out. It may probably be said, *Visum debilitant Balnea, Bacchus, Amor*, as well as *Corpora*: And on the other hand, whatever may be said to preserve the Body in Health, doth preserve the Sight. Smoak and Dust are none of the least Enemies to the Eyes.

Smoak

2.0 x
7.0 x

Mimosa

Medicine
that
pen

The attenuating the *Humor Aqueus*, (which at the same time attenuates the Optick Spirits, depurates and renders the foresaid Tunic and Humour clear and diaphanous) is commonly attempted by inward and outward Medicines, that have a Power to discuss Winds, and move Urine, proceeding from their subtil Particles, that are supposed to be very attenuating, and consequently diuretick, and discutive, these Medicines are usually called *Oxydericks*, that is, Sharpners of the Sight, from *oxy*, acutum, and *derick*, video. Such are accounted all the greater and better, hot Seeds but chiefly *Fennil* and *Daucus*, *Ellicanpane*, *Orange-Peel*, *Masterwort*, *Calamus Aromaticus*, *Virginian Snakeweed*, *Cubebs*, *Galangal*, *Rad. cyperi longi*, & *rotundi*, *Paradise Grains*, *Cardamum*, *Zedoary*, *sem. sileris montani*, *sem. seseli Massiliensis*, *Nutmegs*, and most sorts of Spices. On the other hand, all Antiscorbutick, especially

x. attenuating or thinning

cially Mustard and Garden-Cresses, are accounted pernicious to the Eyes; and Ginger, Pepper, and Persley, as discutient as they are, offend the Sight, and so do most Sowrs. These following are esteem'd specifick Oxydericks, viz. Eye-bright, the greater Celandine, Vervain, Fumitory, Valerian, Avens, Rue and Clary, than which last, nothing can be found a greater darkner of the Sight, and more offensive to the Eyes; for being put into Wort to ferment with it, renders the Drink the most inebriating, and discomposing all the Senses, beyond any other Vegerable, excepting Darnel. And yet being outwardly applied, is very excellling in thinning the Coars of the Eyes, and watery tumours, and very discutient in clearing the Sight from Dimness or Cloudiness. As great an Author as Platerus is, he recommends Radishes and Mustard for specifick Sight Sharpners, than which common Experience doth most certainly convince us, nothing can be a greater Enemy to the Sight: which informs us, that we are not to take things upon trust so slightly, as most Physicians and others are apt to do, without comparing them with the Rules of Experience and Reason.

Those forementioned Aromaticks, Seeds and Roots, are Discutients of Wind by their subtil Particles, which they perform by attenuating of gross Humours into Bubbles, which breaking, emit those Winds, or crude mix'd Aery Spirits, that afterwards are sometimes avoided upwards or downwards, or are impell'd into the Vessels; these mounting upwards, do for a time much disturb the Sight, until they are either discussed by the Spirits that are in the Eyes, and assisted therein by a further continuation of the use of the said attenuating Aromaticks, and Seeds. Hence it is, that very oft those attenuating Oxydericks do render the Sight much worse, and sometimes in Phlegmatick Constitutions usher in Blindness at first, though oftentimes also the continuation of them may discuss the Winds they first rais'd; wherefore a great deal of Caution ought to be used in the Application of them.

So

Things
bad for
the Eyes.Specifick
for y^e Sight

As Dimness

So that it appears plainly, that the same Oxyderick may remedy the Sight, and keep off Blindness in some; though in others they most certainly cause Dimness of Sight, and Blindness.

Diureticks, by carrying off the Salts of the Blood by Urine, (they by drying up the Aqueous Humour, and corrugating or condensing the *Horny Coat*, thicken and tullen the former, and harden the latter in Old People, whose Eyes therefore do appear thick, dull, flat, slow in Motion, &c.) have been experimentally found very advantageous, not only in preserving and meliorating of the Sight, but in preventing and removing many Diseases incident to the Eyes. Among those *Millepedes* or *Sowes* moderately used either in Ale, or otherwise, are universally, and by common Experience, prefer'd beyond all others; for being copiously furnish'd with very subtil penetrating light Spirits, they do not only carry off Salts by Urine, but attenuate and discuss what is gross in the Watery Humour, and all the Tunicks, and subtilize the Animal Spirits; which Qualities seem to render them specifick to the Eyes.

To preserve Sight Some do use *Ground-Ivy* in their ordinary Drink, to preserve their Sight, to no great purpose: But in *Valerian* and *Vervain* (a quantity of one or both being added to the Wort before, or while it is working) many do affirm to have experienc'd a great Power, in preserving their Sight, and removing Dimness.

Dimness to remove To mend the Taste of such sort of Ale, a moderate Proportion of *Elicampagne-Root*, *Orange-Peel*, or a few *Daucus-Seeds* might be added. *Bean-Stalk Ashes*, to the Quantity of five or six Ounces, if they are clean, put to a Firkin of Small Ale after the working, jumbling them well together, and allowing them four or five Days to settle to the Bottom, did they not blunt the Taste of the Drink so much, would prove more powerful, than any of those Vegetables.

* corrugating or contracting
+ condensing & thickning

As

As for the Externals, I should be loth to advise any Person to compound Eye-Waters, to preserve his Sight: The washing the Eyes daily with clear Spring or Rain-Water is sufficient. Water that hath stood long in a Leaden Cistern, is accounted hurtful, there rising a very sharp offensive Steem in length of Time from the Lead, that mixeth with the Water.

External

Spring Water

Those whose Eyes are weak from their Birth, ought to avoid tampering with any sort of Oxydericks, Internal, or External, their Weakness of Sight depending much upon a natural Laxity of the Optick Nerves, and Tunicks; their Humours of the Eye being also thin, and their Optick Spirits loose, and not compact; all which may be easily render'd worse by uncertain Remedies, and never or seldom better, though their Growth in Age, Change of Climate, or Diet, may considerably contribute towards the Melioration of their Sight. A Weakness of the Eyes, that Sicknes might have left, doth oft go off with the Weakness of other Parts, by the Recovery of Strength of the Brain and Bowels. But if that Weakness should singly remain, then besides due Evacuations, general and particular, recourse may be had to proper Internal and External Oxydericks, which ought to be chosen with the strictest Caution.

Among Diseases of the Eyes, I do account a Suffusion, Cataract, and Gutta Serena the most dangerous; and an Ophthalmia, or Inflammation, the most painful, and oft an Antecedent Cause of the others.

A suffusion, or Hypochyma, seems to me to proceed either from some subtle Winds, or Windy Spirits, falling out of the Arteries, or Pores of the Nerves, and breaking into the Watery Humour of the Eye, there causing very minute Bubbles of various Figures, which being actuated or moved by the Luminous Rays, (for when a Man's Eyes are shut, whereby the said Luminous Rays are excluded, he is not in the least sensible of them,) do produce those Appearances of little Bools, Flies, and other

Suffusion

A-Suffusion. or. Pin or Web in the Eye.

small Shapes, floating or flying to and fro before the Eyes.

There are commonly observ'd two kinds of those Suffusions: The one arising from Credidities of the Stomach, or Flatuous Hypochondriack Humours of the Bowels, is not durable, though oft returning by Intervals. Those little Figures, that do deceitfully impose upon the Sight, moving much quicker, than in the other kind, and meeting together, join into a Cloudiness, that quickly vanishes, by reason that those Windy Spirits, which issue through the Pores of the Arteries, being of a Vaporous or Watery Composition, are much lighter, move nimbler, and are much easier discuss'd, than those Windy Spirits, that are press'd out of the Pores of the Nerves, which being of a more Saline, tough, heavy, and compact Mixture, consequently durable, and constantly abiding, (because not easily discuss'd,) make Representations of larger Figures, and are moved much more slowly; and consisting of clammy or viscous most minute Particles, are very apt to unite; whence it happens, that their Representations are dispos'd to grow daily bigger and bigger. These Viscous Windy Spirits are subject to be precipitated, or impell'd to the Pupil, or *Foramen Uvae*, by the constant passing of the Luminous Particles in Beams or Rays towards the said *Foramen Uvae*, where they are concentrated, or gather'd together in the Figure of a Cone, the said *Foramen* forming the narrow End of the Cone, as the *Cornea Tunica* doth the broad. So that they are the said Viscid Nervous Winds, impell'd by the continual passing of the Luminous Rays to the *Foramen Uvae* into an united Body, which at length do form that Præternatural Skin, called a *Cataract*, being a discernable Cause of Blindness, in Contradiction to a *Gutta Serena*, the Cause whereof is not externally discernable, but commonly ascrib'd to gross Humours, obstructing the Hollow of the Optick Nerves, and stopping the Influx of the the Optick Spirits. I cannot but wonder, whence

those

From y
Stomach

From y
Nerve

those gross thick humours should be sent, or how convey'd; not from the Medullar part of the Brain, where Arteries or Veins are scarcely discoverable, and whose very Compact Substance is no more susceptible of any thing that is gross, than the Beginning of the Optic Nerves: Besides, such sort of slimy gross Humours might easily, in the Beginning of a *Gutta Serena* be melted down, and carry'd off by the common Head Purgers, which are generally very strong and churlish, as *Pil. Ethis may*, and *min. Pil. Arabio*, & *duobus. Elect. Indum* &c. & *min.* and all their compounded *Piera's*. So that to me the Etiology of this, and almost of all the rest of the Diseases of the Eyes, seems gross

It is more apparent to me, that the most frequent cause of a *Gutta Serena* is the nervous *Lympha*, (which is the Vehicle, or rather is the *Materia* constituting the grosser Particles, which united with the subtiler and most subtil Particles, separated out of the best and thinnest parts of the Arterial Blood, do compose the Animal Spirits) being grown too gross, thick and viscous in the Optic Nerves, stagnates there, and makes a Damme, thereby hindering and putting a stop to the influx of the Animal Spirits, from the Brain to the Eye, which ought not to be termed Optic Spirits before they arrive thither. By this supposition, a *Gutta Serena* seems to be a Palsie (Paralyse) of the Optic Nerve; all other Palsies, whether universal or particular, being engender'd by no other cause, than by the stagnation of the Nervous *Lympha*, (being render'd gross and viscous) in the beginning of the Nerves in the former, and in particular Nerves in the latter. After a proper Purge or two to clear the Passages, and make room in the Vessels, how little advantage can be expected from frequent Cathartics, though violent, or any other Remedies vulgarly in use against a *Gutta Serena*, or any other Palsie, may be

A
Gutta
Serena

is a Palsy

Purge

Eye Waters.

be easily understood from the formentioned *Hypothesis*; for should you purge *ad infinitum*, you can never pretend to draw off that coagulated Nervous *Lympha*, but rather by drying all the Humours in carrying off the moisture and thinner part, you must necessarily render it worse, which by long continuance doth turn into a hard substance, much tougher than the Nerve it self, or the toughest Leather, and consequently must be incurable. And much less advantage can be hoped from any of the celebrated Eye-Waters, some whereof are pretended to have cured those that have been blind 20 years, and go under the Name of some Queen's or Lady's Eye-Water, all which is no more to be credited, than the Archievements of a Knight Errant; for you may as reasonably pretend to break the Stone in the Bladder by applying *Millepedes* to the Soles of the Feet, as to dissolve a *Gutta serena* by an Eye-Water, if you consider the great distance from the Horn Tunic (to which they are to be apply'd) to the Optic Nerve, the several Coats and Humors of the Eye, the extream tenderness and sensibility of the said Coats, and the necessity of an extraordinary piercing Remedy, which, sure I am, is not greatly to be found in those Aromatics, Seeds, and Oxydercic Leaves, of which most Eye-Waters consist, and are very repugnant to the qualities of Aloes, Honey, *Tuthia*, white Vitriol, Sugar-candy, Sugar of Lead, and other Materials, that are oft ridiculously enough added to them. I do know, that sometimes, once possibly in two or three Ages, a *Gutta serena* hath been removed by an accidental Salivation, othertimes by a most violent passion of Anger, Joy, and sometimes by a sudden frightful Object, throwing the Animal Spirits into an impetuous motion to avoid the same, or by a sudden violent Fever, that by rarefying all the Humours, and putting the Animal Spirits into a violent motion, the viscous Damm hath been pierced

pierced through, and violently expelled. But these are means, that if imitated, do seldom or never attain the success hoped for.

Besides the Cause forementioned, Convulsions, and Tumors of the Muscles of the Eye, near the heads of them, have caused a *Gutta Serena*; the former, by contorting the Optic Nerves, and altering the Figures and Positions of their Filaments, which I do remember occasioned a *Gutta Serena* in the Lord G's Lady, when living in the Pall-Mall, upon the taking of *Vinum Benedictum* (*Maledictum* sometimes) prescribed by her Physician, at the request of the Patient I presume, and probably ill prepared, and overdosed by the Apothecary, contrary to the directions of the Doctor: The latter perform this unfortunate effect, by compressing the Optic Nerve, which sometimes is removed, but not always.

A *Gutta Serena* may sometimes be removed with great difficulty in the beginning, *premissis universilibus*, by potent, sulphurous, and oleous internal Medicines, which under that shape, may preserve a great part of their Virtue until their arrivall to the Brain and Nerves, and possibly some of them may externally be let in by the Vessels of the Head, but then those Internals must be frequently exhibited in large Doses, and continued for a long time, even to the brink of a Fever, or some other contrary Distemper; and this is the only Method to cure all other sorts of Palsies, which I have followed more than once.

A *Cataract* is best cured in the beginning, and whilst it continues to be a *Suffusion*. Internal means are as necessary as external. Sugar of Lead, being well prepared by digesting Spirit of Wine with it, and abstracting it afterwards by distillation, and dissolv'd in a convenient Vehicle, is not only an excellent Topic in this Disease, but in many others of the Eyes, especially in an *Ophthalmia*, *Taraxis*,

Recipe
for the
Eye

and *Chymosis*, Ulcers of the Tunics, and *Epiphora*, &c. for there is a Spirit in Lead, being well corrected and managed, is the most discurient and penetrating of any in respect to the Eyes; besides, the Salt contains a great Sweetness, and is endued with many singular Virtues.

Ophthalmia
-my.

An *Ophthalmia* I do suppose to be occasion'd by Evaporations of the *Lympha*, contained in the capillar *Nervuli*, disseminated in the *Tunica conjunctiva*, being grown very sharp and corroding, (as is formerly mentioned) which Evaporations being condensed into small drops or gleets, and meeting other Juices, cause an effervescency and coagulation, to which pain *supervening* invites other Humours, that together produce such a sort of Inflammation. I have oft observ'd, that the application of cold Medicines (as whites of Eggs, Conserve of Roses, and other Restringtons) hath so little abated the Distemper, that it render'd it much worse. This Disease is sometimes painful to extremity, and very oft of a long continuance, inso-much that I have known it protracted to nine or ten Weeks, and doth not seldom leave other mischievous Diseases behind it.

What Concerns the Practical Part of a Mania or Madness.

Bleeding frequently repeated in the Arm and Foot, also at the *Hæmorrhoids*, is commonly advis'd as an universal and necessary process, to answer the Indication of the Plethory of Humours and Spirits, that most Madmen are subject unto, occasion'd by their greedy and ravenous Appetite; notwithstanding if used more than necessary, it doth certainly cause a *mooping*, and still leave a *desipientia* and depravation of their Internal Senses, so that there must be a great caution used in this par-

mooping

particulars. I do very well know, that by bleed-
ing subtracting the matter, whereout that abundance
of rapid and furious Animal Spirit is engendred,
the disorder of the Brain is oft lessened, but soon
returns again upon the replenishing of the Body.
By abating of the Blood, the Spirits are diminish'd;
and consequently the heat of the Brain, which the
violent motion of the Spirits occasion, must be in
some measure moderated. However, I can look
upon Bleeding no otherwise, than a concurring re-
medy, or a remedy *per accidens*, and doth not di-
rectly answer the Indication of clearing the Body,
and particularly the Brain, of those putrid, acute,
pungent, Saline Particles, nor doth it make that
change upon the Bowels, so as to prevent the engen-
dering the same again, which is the chief Indication
in the cure of a *Mania*.

Bleeding

Strong Purging by *Senna*, *Turkish*, and *Scammony*,
and particularly by black *Hellebor*, is what the pre-
tended Masters of Mad-houses do most depend up-
on, as some Physicians do upon *Antimony*, in the
form of a *Regulus*, *Glass*, or a *Crocus Metallorum*,
whereby they endeavour not only to throw off the
Saburra or heap of gross excrementitious Humors,
but by stimulating and shaking of the Nerves thro'
the Vomits and Stools it moves, they do expect
these slimy putrid Particles should be thrown off
from the Brain and Nerves: And in this some have
been successful, tho' but in few. The inconvenience
lieth here, if by too frequent strong Purgations,
you do drain the gross saline Humors of their *Ser-
um*, which doth both render them fluid, and di-
lute their Acrimony, you do excessively sharpen
those Humors, encrease the Obstructions, and by vi-
olently fermenting of them (which strong Purga-
tives most certainly do) force them to steam up
those putrid pungent Particles, whereby *Maniacs* are
render'd much worse; wherefore it's more advisable,
after a smart Purge or two, to depend upon mode-

Purges

rate

rate Purgatives, as *Pil. Tartar. Quera. Pil. Stomach. cum gum. Diassenna*, &c.

N.B.

After all, Bleeding and Purgatives being only universal necessary premisses, the chief Indication is to rectifie the Bowels, so as to prevent the engendering those gross saline Humors, and to clear the Brain of the foresaid pungent Particles, whereby the several parts of the Brain may be reduc'd to their natural figures and positions, and the exercise of their Function. I do not perceive, that practical Authors do recommend any Remedies of that kind with any confidence, neither do I find many Compositions describ'd in Dispensatories for that purpose, and those that are, differ little from such as commonly are advis'd against Hypochondriac Melancholy, and are to be used for a long continuance, the tediousness of which Course doth not only tire the Physician, but the Friends of the Patients also, who therefore commonly commit them to the care of such, as make it their business, and are willing to be watchful over them, and keep them quiet and in a low moderate Diet, intermixing gentle Purgings, and Bleedings at Intervals, whereby some are recover'd. Now and then when they are very furious, and overwaketul, they give them Opiates. Some use Cupping to the Shoulders, with and without scarification; others use opiate Ointments to their Temples, and bathing of their Heads being shaved, with Decoction of Cephalic Herbs, Flowers and Seeds; also with Lyes made of the Ashes of Cephalick Herbs.

Opiates

Ointments

Several
Mad People
cured in
6 Week,

I have had the fortune to cure several, in a little more or less than six Weeks, by Bleeding of 'em twice or thrice, and Purging them gently with Minerals. In the Intervals I gave them Antihypochondriac Tinctures, compos'd chiefly of Minerals.

By such sort of Remedies as these here hinted at, and the before-mention'd Method, very probably
a whole

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a whole Hospital of Man-folks may be cleared of ten times the number, and forty times less charge, in half quarter of the time.

Maniacs, whose Figures and Positions of the Filaments of the Brain and Nerves have been much changed, and displaced by a long continuance of their Furies, are incurable. I might add a great many Observations to this Head, but the shortness of my time obliges me to come to a

F I N I S.
